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ENTOMOLOGIST.

VOLUME II.

EDITED BY

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SECRETARY TO THE ENTOMOLOGICAL SOCIETY OF CANADA.

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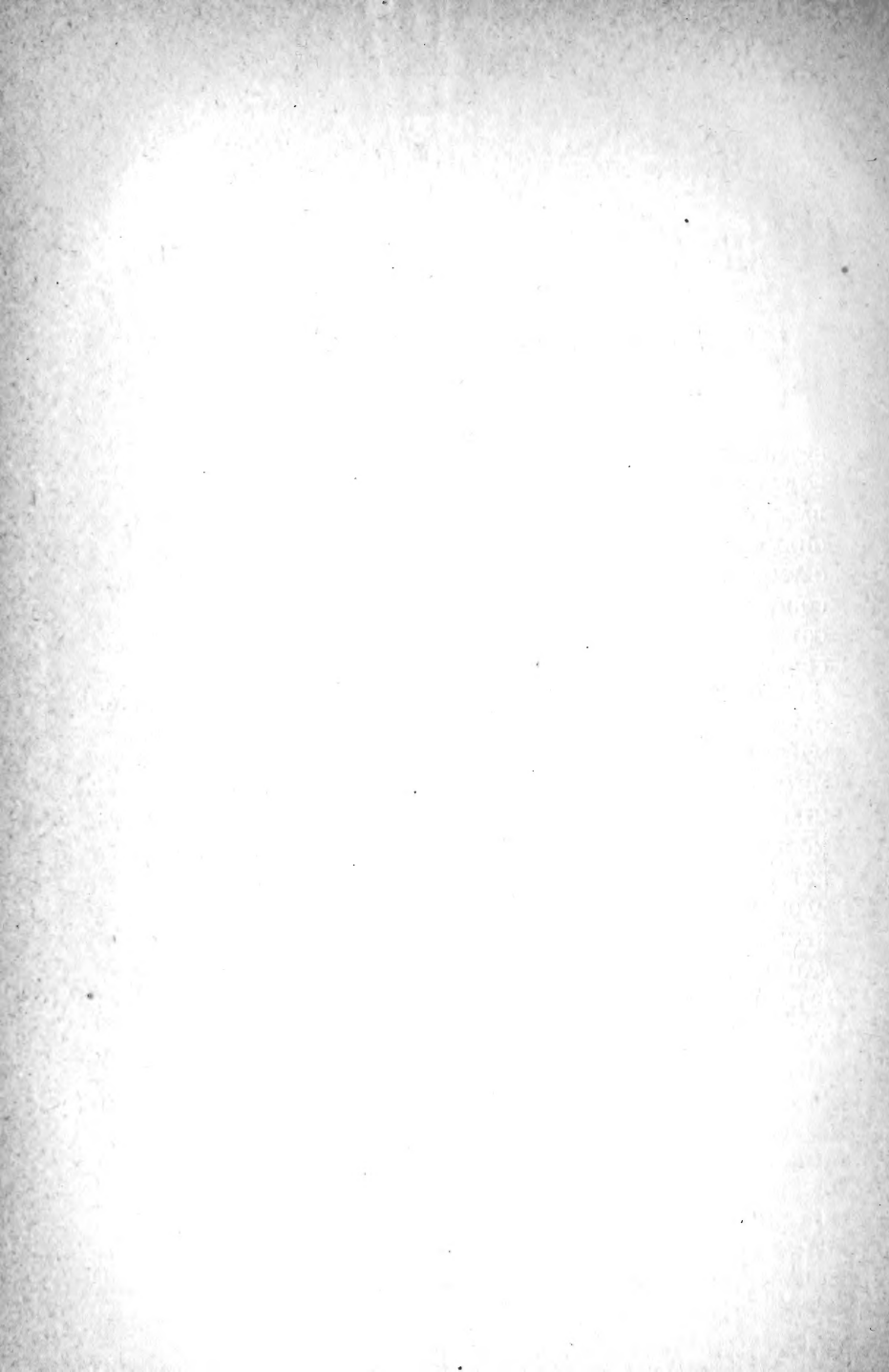
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No. 1.

LARVA INFESTING THE PARSNIP.

(*Depressaria Ontariella*, n. sp.)

BY THE EDITOR.

Last year our bed of garden parsnips turned out so badly, in consequence of the protracted drought of the season, that most of them were not worth digging, thinking, however, that we might as well get some seed from them as they were a good variety, we left them where they were for the winter. When spring came they looked beautifully fresh and green, and soon grew most luxuriantly, sending up tall stems and producing huge umbels of flowers. There was a grand prospect of a fine crop of seed, and we began to promise supplies of it to some of our neighbours, who complained that their's was not satisfactory,—all, indeed, looked fair and promising till the last week in June, when “a change came o’er the spirit of our dream!” The fine umbels of flowers began to look rather unhappy. Decidedly *seedy* in one sense, but by no means “seedy” in another. Webs appeared over them, tiny caterpillars were seen to be thick about them, and very soon the big umbels were contracted into shapeless masses of web and excrement, the flowers were all eaten up, the prospect of seed was utterly and entirely gone! After the flowers were all consumed, some of the more juvenile caterpillars tried the uppermost green leaves, but not finding them to their taste they soon left them, and followed the example of the seniors, who had burrowed into the hollow stems, and were quietly eating the soft white lining, out of sight of all their enemies. Most of them entered the stems at the axils of the leaves, but some few burrowed directly into them, making a round hole in the sides. By the 14th of July, the majority of them had disappeared inside the stems, and there they lay so thick, some in the larval and some in the chrysalid state, that one could hardly cut a stem in two, at a venture, with a knife, without performing the same operation on a pupa or larva as well. Some of the caterpillars were so unkind as to wander off to a bed of the newly sown parsnips and eat a goodly quantity of them, after having destroyed all our

second year's crop; in this case they seemed to relish the young green leaves, while in the older plants they would hardly touch anything but the flowers and the lining of the stems.

The following is a description of the mature larva:—

Length 0.70 inches. General color dirty green above, yellowish on sides and beneath. Head deep shining black, emarginate posteriorly; second segment with a similarly shining black trapezoidal shield above, divided in the middle by a fine suture, the rest of the segment greenish yellow, with three small black warts on each side; remaining segments, except the eleventh, dirty green above, yellowish on sides and beneath; eleventh segment entirely dull yellowish; all the segments, except the first two, have four dorsal, eight lateral (four on each side), and four ventral, shining black warts, each emitting a fine hair, black tipped with white,—some of the ventral warts are absent, where their place is occupied by the feet; dorsal line dark green, fine, rather indistinct. Legs shining jet black; prolegs dirty greenish yellow; three pair of the former, five pair of the latter—sixteen feet in all.

Young larva:—Length 0.30 inches. Similar in all respects to the mature larva, except that the color of the first four segments is rather darker, and of the remainder more yellowish.

Pupa:—Length 0.40 inches; dark brown, abdomen a little paler; enclosed in a slight silken cocoon inside the hollowed stem.

The insects remained a fortnight in the pupa state, the moths beginning to appear on the 1st of August. They proved to belong to the genus *Depressaria*, of the family *Gelechiidae*, group *Tineina*. A full description of the characters of this genus is given by the late Dr. Clemens in his article on "American Micro-Lepidoptera," (Proceed. Ent. Soc. Philada., vol. ii., No. 2, page 124). The most striking peculiarities are the indentation of the hind margin of the secondaries toward the anal angle, the brush-like second joint of the labial palpi, and the flattened abdomen with its projecting scales at the sides.

But very few American species of this genus have yet been described, though no doubt many will be found when collectors begin to turn their attention more particularly to the Micro-Lepidoptera; at present most of us find that we have quite enough to do in trying to investigate the Macros, the field in this department being large enough to occupy the attention of an immensely increased number of Entomologists for years to come. The species before us has evidently not been described by any American writer, nor do we find that it corresponds to the brief description of any of the British species contained in Mr. Stainton's *Manual*. Mr. Curtis relates that *D. applanata*, *depressella*, and *daucella*, affect carrots and parsnips in England,

but they appear to differ very much from our species. *D. pastinacella* resembles ours in color, but the description does not otherwise tally; its food-plant, judging from the specific name, is the same, though no account is given of the larva in any books that we have access to. As then the ravager of our parsnips is in all probability a native and not an imported insect, affecting some wild plant of the same character, we may call it from the name of this Province, *Depressaria Ontariella*.

The following is a description of the imago:—

Depressaria Ontariella, n. sp.—Alar exp. 0.90 inches; length of body 0.40 inch; wings with a satiny lustre. Primaries greyish fuscous, varied with black scales and blotches; a small black spot at the base of the costa; basal third irregularly marked with black spots and blotches, and with a few whitish spots—these vary very much in different specimens; termination of the disk with a whitish spot, partially margined with black: a very much curved transverse fascia composed of parallel longitudinal black streaks, proceeding from the costa and terminating before the hind margin; then a somewhat conspicuous outwardly angulated narrow dusky white fascia, forming a more or less distinct V across the wing; and next an indistinct dusky fascia, a narrow subterminal line, and a terminal row of deep black points. Fringe fuscous, broadly edged with whitish.

Secondaries semi-transparent, whitish, darker towards apex and exterior margin; nervures distinctly marked with dusky scales. Fringe long and dusky, longer and much paler towards the anal angle.

Under side of primaries dusky, without any markings, except a terminal rim of black points; secondaries much paler, with black points towards the apex on the exterior margin.

Head, thorax, and abdomen above fuscous; labial palpi fuscous above, brush of second joint black beneath, third joint black tipped with white; abdomen with a row of black spots along each side.

These moths, or possibly a late brood, though we do not see what a later brood would have to feed upon, hybernate and may often be seen flitting about rooms and emerging from behind curtains even in the depth of winter. They are usually mistaken for clothes-moths, and indeed we always hitherto regarded them as such ourselves, and were immensely surprised when we found them to be the product of our parsnip worms.

As some of our horticultural readers may be troubled with a super-abundance of this insect, and be desirous of learning a mode of getting rid of it, we may suggest a remedy. As soon as the young caterpillars appear upon the flowers, dust the umbels well over with powdered white hellebore, and repeat the operation occasionally, as all the larvæ do not appear at once.

Should they escape notice at first, and the flowers be destroyed, cut off and burn the affected stalks before the moth has time to emerge from the pupa, and thus reduce the numbers of the destroyer for the ensuing year. As the caterpillars are very active and wriggle about or drop down upon the slightest disturbance, they may easily be dislodged from their haunts and collected in a pan or seive, and then burnt in the fire. It is possible that various parasites prey upon these insects, and assist in keeping them in check, though none have as yet been hatched from our specimens. Their numbers in our garden are, however, being rapidly reduced by a Wood-pecker (*Picus villosus*), who daily visits the parsnip stalks and pegs away with right good will at the larvæ and pupæ within.

ON A SUPPOSED NEW ARCTIAN.

BY W. SAUNDERS, LONDON, ONTARIO.

On the 24th of April, 1868, I found under a log, near the Port Stanley Railroad track, a short distance from London, a young larva of an Arctian, which I supposed to be *Parthenice*, but since it differed slightly in appearance from the young of this species which I had reared before, I resolved to trace its history. In common with other allied species, this had evidently hybernated the winter through in the larva state, and had just awoke from its torpor. The following description was taken at the time of capture :

Length, 0.40 inches ; head rather small, bilobed, black, and shining, with a few short hairs.

Body above, dark brown, with transverse rows of shining black tubercles from which arise spreading tufts of black hair, a few hairs in each tuft on hinder segments much longer than the others ; a faint dorsal stripe a little paler than general color.

Under surface of the same shade as upper, but a little paler ; 5th, 6th, 11th and 12th segments with a transverse row of tubercles in continuation of those above, with a few short brownish hairs arising from each ; feet, brown, banded with black ; prolegs, pale brown.

In common with most other Arctians its appetite was not dainty. It would eat almost any green herb. I fed it on dandelion and lamb's quarter (*Chenopodium album*).

After the next moult, the body assumed a pale dirty brown tint, darker along hinder segments, with tubercles as before ; hairs somewhat shorter ; body strongly annulated. The under surface paler, with a faint reddish tint ; feet black, with bands of yellowish brown.

About the middle of May it moulted again, and on the 18th the following description was taken :

Length 0.85 in.; head larger in proportion to body than before, not so strongly bilobed, rather flattened in front, deep black, with a few short hairs; palpi dull reddish tipped with black.

Body above distinctly annulated, of a deep velvety black color, with tubercles as before, hairs much longer, chiefly black, those on hinder segments longer than the others, with a few whitish ones mixed with them. Along each side of body, close to under surface, is a row of tufts of reddish-orange hair.

Under surface dark brown, with a row of tubercles on 5th, 6th, 11th and 12th segments, with short tufts of reddish-orange hair; feet black, with pale streaks; prolegs reddish orange.

From the 20th May to the middle of June the larva made very little growth, and about the latter date began to contract previous to entering the pupa state. On the 20th of June I observed that it was spinning a light web, and about to undergo its change when another description was taken:

Length 0.80 in.; head medium size, black and shining.

Body above pale brown, with dull black tubercles and spreading tufts of black hairs; a dorsal stripe pale, dull, whitish pink.

Under surface dirty brownish white; hairs on tubercles on 5th, 6th, 11th and 12th segments short, blackish; feet blackish brown; prolegs pale brown and hairy.

On the 22nd of June it changed to a dark brown chrysalis, producing the imago July 6th, which proved to be a female.

ARCTIA BIMACULATA, n. sp.—Expands one inch: palpi reddish; head, antennæ and thorax reddish brown; Abdomen stout, dull red with a faint broken dorsal line; body below, brownish red; feet of a little darker shade.

Primaries above *dull reddish brown, with a round white spot within the middle* and just below the median vein.

Secondaries dull red, with a black spot about the middle, and a *wide, irregular band along the hind margin*, extending from the anal angle to near the tip, where there is a small black dot. The hinder part of this band lies close to the hind margin; beyond, it is slightly advanced, having a streak of red between it and the edge; margin edged with a blackish line, fringe reddish.

Under surface of both wings red, of a little brighter shade than secondaries above.

Primaries have a blackish irregular bar across the end of the discal cell and extending a little way above it, nearer the tip is a brown dot. The white spot above is scarcely produced below, being red, a little fainter than general color.

Secondaries have the same markings as above, the central spot is a little larger and the marginal band narrower, not extending to the hinder edge of wing.

NOTES ON *ALARIA FLORIDA*, Guén.

BY W. SAUNDERS, LONDON, ONT.

In July of last year there bloomed in my garden a fine plant of that variety of evening primrose known as "*Lamarckiana*" (*Oenothera Lamarckiana*). I had been advised by an Entomological friend to procure this flower with the view of attracting moths at night, and found it to succeed admirably. Its lovely yellow petals expand suddenly about seven o'clock every evening, and diffuse a fragrance all around very attractive to Sphingidæ and other nocturnal moths. The flowers expand about three inches and are very beautiful; they remain expanded until sometime after sunrise the following morning, when they close to open no more. The plant flowers abundantly, fresh ones appearing every evening.

I was surprised at the number of specimens of *Alaria Florida* which were attracted—a charming little moth with the greater part of its fore wings covered with brilliant rosy red. It had always been a rarity with me before, indeed for several years I think I had not met with it at all; but now, night after night I found them hovering around these flowers, and on several occasions found three or four specimens the morning following buried amidst the closing petals.

After a few days I saw no more, but soon observed a smooth green caterpillar feeding on my favorite plant. Not content with eating the leaves only, these marauders had a special preference for the flower buds, eating away into their tender substance and utterly destroying them. It did not occur to me at the time that this might be the larva of *A. Florida*, but so it afterward proved. After killing most of them, several were reserved and fed for some time on the leaves of the plant, after which they changed to pale brown chrysalides. The following is a description of the full grown larva:

Described July 25th—Length 1.10 inches; cylindrical.

Head rather small, slightly bilobed, pale yellowish green; mandibles tipped with dark brown.

Body above pale green semi-transparent; a dorsal line of a darker green, due to the transparency of skin showing the internal organs; a lateral line of the same shade of color, but fainter; *second segment with a patch of pale dull red on each side*; entire upper surface downy, with very short pale brown and whitish hairs scarcely visible without a magnifier; spiracles pale brown.

Under surface similar to upper, a little darker shade of green prevailing on anterior segments; feet and prolegs green, the latter faintly tipped with brown.

These remained in the chrysalis state during the fall, winter, and spring, producing the perfect insect early in July, 1869.

NOTE BY ED.—In July, 1866, and again in the same month of 1868, I had the pleasure of spending a short time at Weston, with the Rev. W. A. Johnson. On both occasions we took a number of specimens of *A. Florida* on the flowers of a variety of Evening Primrose; some were taken at various hours of the night, and others in the morning, entangled in the closing petals; we also found a number of larvæ, similar to those described above, eating into the flower buds, and ruining the beauty of many of the blossoms. I was anxious to trace the history of these caterpillars, fancying they must have some connection with the pretty *Alarias*, but having no *Oenothera* plants at home, I thought it was useless trying to rear the larvæ; I am very glad to find that Mr. Saunders has solved the question for us. During my last visit Mr. Johnson gave me an enormously magnified drawing from the microscope of an egg of this insect, which was laid at 4.30 a.m., on the 15th of July, 1868. In shape it resembles an orange, being circularly flattened at the top, and supported at the base on a short stem-like attachment to the flower bud; the sides are slightly crenate longitudinally, and ornamented with minute circular prominences. I have also taken the moth on the flowers of the wild species of *Oenothera* in this neighbourhood, but always in the evening, and during the month of July; this year I have examined numbers of these plants, but have not found a single specimen of the moth or its larva; last year they were tolerably common.

LIST OF COLEOPTERA,

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from page 107.)

CARABIDÆ.

PLATYNUS, Bon.

Hypolithos, Say.

Marginatus, Chaud.

Sinuatus, Dej.

Extensicollis, Say

Decorus, Say.

**Moerens*, Dej.

Melanarius, Dej.

**Metallescens*, Lec.

PLATYNUS (continued).

Harrisii, Lec.

Cupripennis, Say.

Punctiformis, Say.

**Subcordatus*, Lec.

**Vagans*, Lec.

Retractus, Lec.

Ruficornis, Lec.

Octopunctatus, Fab.

(To be continued.)

PLATYNUS (continued).

Placidus, Say.

Obsoletus, Say.

Stigmaticus, Lec.

OLISTHOPUS, Dej.

**Parmatus*, Say.

**Micans*, Lec.

PTEROSTICHUS, Bon.

**Sustentus*, Lec.

* Species marked with an asterisk have not been before included in the list of Canadian Coleoptera.

MISCELLANEOUS NOTES.

BUTTERFLIES IN JULY.—The present season, though cool and wet, I have found very much better for collecting Lepidoptera than the two previous hot and dry summers. During the month of July, I have captured, or seen, specimens of the following butterflies, although I have had but few opportunities for making anything like an Entomological excursion. *Papilio turnus*, *troilus*, *asterias*; *Colias philodice*; *Danaïs archippus*; *Argynnis cybele*, *aphrodite*, *bellona*, *myrina*; *Melitæa tharos*; *Graptæ interrogationis*; *Vanessa J-album*, *milberti*, *progne*, *antiopa*; *Pyrameis atalanta*, *cardui*, *huntera*; *Limenitis arthemis*, *dissipus*; *Neonympha eurythris*; *Erebia nephele*; *Thecla inorata*; *Polyommatus americana*; *Eudamus tityrus*; *Hesperia hobomok*, *Leonardus*, *Peckii*, *ahaton*. Twenty nine species in all. I have no doubt that many of our Canadian collectors have done much better than this, and I trust they will let our readers know it, though I think the above list is not bad for a single month, characterized as it was by so many cold and rainy days. Some species have been excessively abundant; e. g. *C. philodice*. *D. archippus*, *V. antiopa*, *P. cardui*; others unusually numerous; e. g. *V. milberti*, *P. huntera* and *atalanta*, *L. arthemis* which is usually very rare, *N. eurythris*, *E. nephele*, and *Thecla inorata*.

On the 3rd of August, a lovely bright warm morning, after an excessively wet night, I drove about ten miles along country roads. Every few yards there was a patch of mud, the effects of the heavy rain, and at every patch of mud there were from half a dozen to twenty specimens of *Colias Philodice*,—at least one, I should think, for every yard of distance that I travelled. I must, then, have seen at a very moderate computation, about 10,000 specimens of this butterfly! There were also, I should judge, about one-fifth as many specimens of *Vanessa antiopa* flying about, besides numbers of other common butterflies.—C. J. S. B.

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The Canadian Entomologist.

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TO THE READER.

In order to enable future volumes of the CANADIAN ENTOMOLOGIST to date their commencement from a less awkward time than the middle of a year, as well as for other reasons that it is needless to specify, we have resolved upon spreading the publication of the current volume over the remainder of this year and the whole of the following one; we shall thus issue a number about every six weeks instead of monthly, and begin volume three in January, 1871. The following will be the dates of issue of the remaining numbers of this volume, so far as they can be decided upon beforehand:—No. 3, on November 15, 1869; No. 4, on January 1, 1870; No. 5, February 15; No. 6, April 1; No. 7, May 16; No. 8, July 1; No. 9, August 15; No. 10, October 1; No. 11, November 1; No. 12, December 1. In accordance with this arrangement, we have delayed the issue of the present number, as will have been observed, from September 15 to October 1. Contributions for publication should be in the hands of the Editor about ten days before the date of issue of a number, in order to secure insertion in it.

ON A SPECIES OF HEMITELES (*Ichneumonidæ*),

Ascertained by the Editor to be parasitic in Canada on the imported Currant Worm Fly (*Nematus ventricosus*, Klug.).

BY BENJ. D. WALSH, M.A.

Not a single American species of *Hemiteles*, so far as I am aware, has as yet been described under that generic name as occurring north of the West India Islands. Two of Say's *Cryptus*, indeed, namely *Cr. orbis*, found in Indiana, and *Cr. tenellus*, found in Pennsylvania, manifestly belong to this genus; and the latter may not improbably be identical with our insect, though his description is insufficient to identify it, and scarcely separates it from *Hemiteles thoracicus*, Cresson, an inhabitant of Cuba. In my own cabinet, besides the species that we now have to do with, I have no less than nine undescribed species of this genus that were captured or bred in Illinois. The genus may be conveniently divided into two principal groups, according

to the presence or absence of metathoracic thorns; and of my undescribed species but two belong to the latter category. In fact it would seem from the following table, that a thorned metathorax is rather a S. A. than a N. A. character.

GENUS HEMITELES.

GROUP A.:—Two thorns more or less distinct, one on each side of the metathorax, and directed backwards and outwards. *H. tricolor*, Brullé, Brazil. *H. fuscipennis*, Br., Brazil. *H. xanthogaster*, Br., Brazil. *H. rufiventris*, Br., S. Am. *H. striatus*, Br., Columbia. *H. lepidus*, Br., Brazil. *H. pulchellus*, Br., Brazil. *H. fuscipennis*, Br., Hayti. *H. incertus*, Cresson, Cuba, and two undescribed species from Illinois, U. S. In all 7 S. A., 4 N. A. sp.

GROUP B.:—Metathorax unarmed. In all 13 N. A. sp., and none at all from S. A.

a. Wings not banded with fuscous. *H. amœnus*, Cress., Cuba. *H. bicinctus*, Cress., Cuba. *H. subflavescens*, Cress., Cuba. *H. [Cryptus] orbus*, Say., and six undescribed species from Illinois, U. S.*

b. Wings with one fuscous band. One undescribed species from Illinois, U. S.

c. Wings with two fuscous bands. *H. [Cryptus] tenellus*, Say., Penna., U. S. *H. thoracicus*, Cresson, Cuba. *H. nemativorus*, n. sp.

Through the kindness of the Editor, my cabinet has been enriched by a fine ♀ specimen of *H. nemativorus*, of which I had previously possessed but three ♀, captured at large in Illinois. His account of its larval and pupal history is as follows: "On June 29th I observed to my surprise a Saw-fly cocoon (*Nematus ventricosus*, Klug.) attached to a leaf high up on a gooseberry bush, instead of on or under the surface of the ground as usual. Thinking that the unwonted situation might be the effect of a parasitic attack upon the larva, I brought the specimen in, and a few days afterwards found that there had emerged from it the Hymenopteron that I now send you!" Now, as I know that this very same species of *Hemiteles* occurs near Rock Island, in Illinois, where as yet *Nematus ventricosus* has not been introduced, it follows that it could not have been imported from Europe along with this pestilent Saw-fly, but must be in all probability an indigenous species. Hence we may draw the further conclusion, that a native American parasite can and sometimes does acquire the habit of preying upon a vegetable-feeding insect imported among us from Europe. The same conclusion, indeed, follows

* In 1830 and 1861, as I have stated in a paper on the Injurious Insects of Illinois (Trans. Ill. St. Agr. Soc. IV., p. 369), I bred from 50 to 70 ♂ ♀ individuals of an undescribed *Pezomachus* (*P. heteropterus*, Walsh, MS.), a genus which is normally aptersqs and has an aborted thorax like that of a worker ant. Out of this large number there were produced four males, which had the complete wings of a *Hemiteles*, and all the other characters of that genus, including of course the fully-developed thorax. Hence I infer that a *Pezomachus* is nothing but a degraded *Hemiteles*. I may add that this species—as well as two other *Pezomachus* in my collection, including *P. minimus*, Walsh—had no metathoracic thorns, and that the winged ♂ ♂, belonged to B. a of this table.

from a fact which I published in 1866 (*Pract. Entom.* I. p. 120), namely, that this very same Imported Saw-fly is preyed upon by another indigenous Ichneumon-fly, the *Brachypterus* [*Cryptus*] *micropterus* of Say, which was described in 1836, or twenty years before the Saw-fly, which it now infests, had crossed the Atlantic. But on a question such as this, which is not only of great scientific interest, but of high practical importance, it is as well to make assurance doubly sure.

It may be remarked here that—as we shall have occasion to state also in a forthcoming illustrated Paper on “Currant and Gooseberry Worms” in the *American Entomologist*—we have recently heard from Mr. Wm. Saunders, of London, Ontario, that *Nematus ventricosus* very commonly with him spins up above ground on the bushes, as in the case referred to above. This fact is of especial interest, because it has not hitherto been observed in the States, and because European authors noticed it long ago as the habit of this same species on the other side of the Atlantic. Indeed Dahlbom was absurd enough to manufacture two species out of this one—although as he says himself the perfect insects are as like each other as one egg is like another egg—basing his specific distinction solely upon this slight difference in the habits of his two so-called species. To be consistent, he ought to have ground out a third species from those individuals that spin up, not under the earth, but on the surface of the earth. (See on this subject *Pract. Entom.* I. p. 125.)

HEMITELES NEMATIVORUS, n. sp.—♀ Rufous and almost microscopically punctate and subopaque. Head with the ocelli, and sometimes the space enclosed by them, black. Antennæ with joints 3 and 4 equal in length, and each four times as long as wide, joint 5 a trifle shorter than 4, joint 6 and the following gradually shorter and shorter; brown-black, their basal $\frac{1}{2}$ or $\frac{2}{3}$ rufous beneath with the incisures brown-black. Thorax with the parapsidal grooves obsolete, and the normal metathoracic carinæ strongly and fully developed. The suture at the base of the scutel, a narrow vitta on each side of the mesonotum abbreviated more or less in front or sometimes entirely absent, the extreme tip of the methathorax and more or less of its basal part, or sometimes the entire metathorax except a lateral rufous spot at tip, all brown-black. Abdomen with joint 1 two and a half times as long as wide, and fully twice as wide at tip as at base; joints 2–8 forming a depressed oval mass $2\frac{1}{2}$ or $2\frac{3}{4}$ times as long as wide and expanding in its middle to nearly twice the extreme width of joint 1. Joint 1, 2, and usually the base of 3, rufous, joint 1 sometimes clouded with brown-black, and in the Canada ♀ entirely brown-black; the rest of the abdomen brown-black. Sheaths of the oripositor brown-black, projecting from the tip of the abdomen by nearly half its length. Legs dull rufous. The 4 front legs, with the femora superiorly and the tibiæ exteriorly, and the entire tarsi, all brown—black, the dark color most extensive in the Canada ♀. Hind legs with the tip, and in the Canada ♀ the whole, of the femur, the entire tibiæ except their basal, $\frac{1}{2}$ which is whitish, and also the entire tarsi, all-brown black. All the coxæ and trochanters sometimes, especially in Canada ♀, a little varied with brown-black, more so (as is usual in *Ichneumonidæ*) in each successive pair of legs. Wings hyaline; veins black; stigma twice as long as wide, triangular, black, its basal $\frac{1}{2}$ or $\frac{1}{3}$ white. A fuscous band straddling the basal cross-veins of the front wing, and a much wider fuscous

band extending across the wing from the base of the stigma to the tip of the marginal cell, but always leaving a more or less extensive hyaline spot at the tip of the stigma. Length ♀ (exclusive of oripositor) 0.12–0.19 inch, the Canada ♀ and one Illinois ♀ attaining the largest dimensions. Two ♀ from Illinois, one ♀ from Canada; ♂ unknown.

Variety *fuscatus*.—♀ Differs in being smaller and in being still darker even than the Canada ♀, and may possibly, but I think not, be distinct. The black spot inclosing the ocelli extends on to the upper posterior orbits; the entire upper surface of the thorax, including the scutel, is brown-black, except a narrow rufous vitta on each side of the mesothorax; and, as in the Canada ♀, the entire abdomen, except joint 2, is brown-black. Legs as in the Canada ♀. Wings normal. Length ♀ 0.10 inch. One ♀ from Illinois; ♂ unknown.

The ground-color of *tenellus*, Say, is said to be "honey-yellow," not rufous as in *nemativorus*; he says nothing of the conspicuous basal white spot on the stigma; and he describes the abdomen as "honey-yellow, blackish at tip," whereas in my palest specimen by far the largest part of the abdomen is dark-colored. About the legs he says not a single word; whence, as he gives "honey-yellow" as the general color, it is to be inferred that they were honey-yellow immaculate. Neither does he tell us whether he described from one specimen or from fifty; so that we are left entirely in the dark as to how far the few characters which he gives may be considered as reliable specific characters, and how far as mere individual variations. On the whole, we must consider the question whether *Cryptus tenellus*, Say, be identical with *Hemiteles nemativorus*, Walsh, as one of those unimportant scientific enigmas which—as Say's entire collection has perished—can never now be solved with any degree of certainty, and about which it is therefore useless to bother our brains any further.

This species comes very near to *H. thoracicus*, Cresson, from Cuba, described from a single ♀, but may be distinguished as follows: 1st. The ground-color is rufous, not "clay-yellow." 2nd. The dorsal lines of the thorax, or parapsidal grooves, are entirely obsolete, not "deeply impressed." 3rd. The pleura is never "brown." 4th. The basal dark band of the front wing straddles the basal cross-veins, instead of being "at the base of the first sub-marginal cell." 5th. The abdomen always has joint 2 rufous and is never "brown with the apical margins of the segments somewhat pale."—I may remark here that in *Pimpla* [*Cryptus*] *conquisitor*, Say (= *Cr. plurivinctus*, Say), and especially in *Pimpla annulipes*, Brulle; the size of the largest ♀ is double that of the smallest ♀, as I know from examining some 50 or 60 specimens of each species. So that the discrepancy in size between the largest *H. nemativorus* ♀ (0.19 inch), and what I take to be a variety of this ♀ (*fuscus* ♀, 0.10 inch), is by no means unparalleled in this Family.

NOTES AND EXPERIMENTS ON CURRANT WORMS.

BY W. SAUNDERS, LONDON, ONT.

The larva of *Nematus ventricosus*, alas, too well known under the popular designation of "currant worm," has been very abundant in this neighbourhood during the present season. In my own garden it has been a continual fight as to who should have the currant and gooseberry bushes, the worms or their rightful owner. During the early part of summer, anticipating their attack, I was on the look out for them and by timely doses of hellebore preserved the foliage with but little damage. In about a fortnight later, having omitted inspection for a few days, I was surprised to find the bushes being stripped again; and this time the enemy had got so far ahead as to damage their appearance considerably. Another prompt dosing of hellebore brought relief. After this I hardly ever found all the bushes entirely free from them; a walk around the garden would reveal a few here and a few there, and I was perpetually hand-killing and brushing off these smaller detachments. Four times during the season I found it necessary to apply hellebore freely, for the foes were a legion.

During the middle of August, being occupied with other matters, the garden was neglected for a few days, when on visiting it again on the 19th, I found many of the bushes entirely leafless, and the foliage remaining on the others was rapidly disappearing. I felt discouraged and began to have some misgiving as to whether hellebore was after all such an unfailing panacea for this almost universal pest, as we had supposed. I resolved if possible to satisfy myself fully on this point, and having mixed about 1½ oz. of powdered hellebore with a pail of water, was ready to proceed. I selected a leaf from two bushes, marked them and counted the number of their inhabitants—one was occupied by *forty-four* worms of different sizes, crowding it above and below, and it was about half eaten; the other leaf had twelve nearly full grown on it. Having transferred the mixture of hellebore and water to a watering pot, the bushes were sprinkled with it. I returned to examine the results in three quarters of an hour, and the leaf which at first had forty-four on it, had now only two, and these were so far exhausted that they were unable to eat and could scarcely crawl, while on the other leaf out of the twelve there remained three, but in the same enfeebled condition. All around under the bushes, the ground was strewed with the fallen foe, and I felt perfectly satisfied that entire reliance might be placed on this means of defence.

I did not anticipate such speedy action on the part of the hellebore or should have returned to the examination sooner, and the bushes were so entirely cleared, that excepting on one I had reserved for another experiment, I had no means of repeating the dose.

There was one thing that struck me as somewhat remarkable, the portion of leaf on which the greatest number were feeding, appeared to be the same size as before the hellebore was applied; if smaller I could not perceive it. When the leaves dry, which have been sprinkled with liquid, a very thin coating of the powder, more or less regular, is found over them, and I had always supposed that death resulted from eating a portion of the leaf thus coated. Such is undoubtedly the case when the hellebore is applied dry, but in this case a meal however small made by *forty-four caterpillars* on half a leaf, must have materially diminished it. I am disposed to believe then that the death of most of these must have resulted from their imbibing or absorbing some of the liquid as soon as applied. Many of them showed symptoms of the violent cathartic action of the remedy, having a mass of soft exuvia hanging to the extremity of their dead bodies.

I had reserved one bush, on which were a good number for another experiment. It sometimes happens, especially with those who live in the country, that hellebore is not at hand when the worms are first observed at work, and a few days' delay in procuring it is perhaps unavoidable. In such cases the bushes may be entirely leafless, before the remedy can be applied. Hot water suggested itself to my mind as likely to be of some service, and being also an article readily procurable in every home. It is well known that many plants will bear such an application without injury, provided the heat is not too great. Taking some in a watering pot, a little hotter than one could bear the hand in, I showered it plentifully on the affected bush, and it was amusing to see how the caterpillars wriggled and twisted and quickly letting go their hold, fell to the ground, which was soon strewn with them. After the first excitement produced by the sudden heat was over, they remained as if wishing to "cool off" before commencing work again. A few did not recover from the application, but most of them were soon as active as ever.

Now what I would suggest is this, that where hellebore cannot be at once procured, no time should be lost in applying the hot water, and when once on the ground the creatures may have the life trodden out of them by the foot, or beaten out with the spade or some other implement. In any case many of them would never reach the bush again, for enemies beset them on every side. I was amused to see how busy a colony of ants were who had a home at the base of a tree near by, lugging these large caterpillars along, a single one of which would take three or four to manage. The worms were twisting and jumping about as if they wondered whose hands they had got into, and the ants were hanging on with their sharp jaws and slowly dragging the bodies along. By and by they had quite a little pile accumulated, which would no doubt furnish them or their progeny with a feast of fat things for some time to come. Then there are the tiger beetles (*Cicindlidæ*), with a

host of others ever running about, looking for stray objects of this sort on which to make a dainty meal.

I had observed on one of the bushes, before applying the hellebore, some friends at work on these worms. They were immature specimens of a true bug belonging to the order *Hemiptera*, and probably the young of *Strictus fimbriatus*. These creatures are nearly round, about the size of a common lady-bird, having the head, thorax and legs black, and the abdomen red with an elongated black spot in the centre, divided across by a whitish line. Approaching a caterpillar, they thrust their proboscis into it and quietly suck its juices until it becomes so weak and exhausted that it shrivels up and dies. With the view of testing the probable amount of good these friends were thus capable of accomplishing, I shut up two of them in a small box, with a dozen nearly full grown caterpillars, and at the end of three days found that they had consumed them all; also six in another box with one bug, and in this instance the rate of consumption was about the same, two caterpillars a day for each of these little creatures. The second time I fed them they did not get through their work quite so quickly; possibly they may have overfed themselves at first.

While turning up the branches of some of my gooseberry bushes, I observed a number of whitish eggs on some of the leaves, arranged lengthwise in regular rows at short distances apart, on the principal veins or ribs of the leaf. Usually they were placed singly in the rows, but here and there double. These were the eggs of the currant worm, they were about one twentieth of an inch long, four times as long as broad, rounded at each end with a whitish glossy surface. On the branch I was examining there were three leaves with these eggs on; two of them had their principal veins pretty well covered, while the third had but a few on it, as if this had been the work of a single insect who had exhausted her stock before the third leaf was covered. I counted these, and found there were 101 in all. Having just then caught one of the parent flies, a female who was hovering about as if looking for a place on which to deposit her eggs, I squeezed some eggs out of her body and comparing them with those on the leaf, found they were only about half the size, showing that the first must have grown considerably after being laid and that they were probably nearly ready to hatch. In about three hours afterwards, I observed that several of the young larvæ had come out of the eggs, and placing the leaf under a microscope had the good fortune to see some of them escape. The egg consisted of a thin elastic membrane sufficiently transparent to give a dim view of the enclosed larva. The black spot which is placed on each side of the head in this species, enabled me to determine the position the creature occupied. It was somewhat coiled up and resting on its side with its jaws against the side of the egg not far from its

extremity. I could not perceive that it had any other means of rupturing the egg than by its mandibles, which were working visibly within. In a short time the egg was ruptured and the head of the larva protruded from the orifice. Withdrawing its two front feet from the egg, it seized the leaf on which it was placed, and by raising up its back and working itself from side to side, it soon worked itself out. The time occupied in thus extracting itself from the first appearance of the head, varied from six to ten minutes, for I watched several of them through the process. The egg was so thin and elastic that it yielded readily to the motions of the body, and adhered very closely to it, contracting and shrivelling up as the body was withdrawn.

After the larva comes out it does not consume the egg or any portion of it, as is the case with most Lepidoptera, but sets to work at once eating the leaf on which its considerate mother placed it. When just hatched the worms are about one-twelfth of an inch long; head large, dull whitish with a round dark spot on each side, and a few minute short hairs; mandibles pale brown. Body above and below whitish, semi-transparent, sometimes with a slight greenish tinge. From this time it rapidly increases in size, becoming green, then changing to green with many black dots, and finally reverting to plain green again, tinged with yellow at the extremities, just before it becomes a chrysalis.

I have a fact to communicate regarding the winter history of this insect. It has been universally held, that the larvæ, when they leave the bushes in the fall, at once construct their cocoons, either at the surface of the ground or just below the surface, and change to a chrysalis either then or sometime before early spring. Possibly as a rule this may be the case, if so I have an interesting exception to record. On the 22nd of May I was trying some experiments in crossing gooseberries, fertilizing the flowers of the Houghton's Seedling with some of the large English varieties, and having operated on several branches, tied them up in new paper bags to prevent interference with the work, either from insects or otherwise. The particular bag I am about to refer to, was attached to an upright branch on the summit of the bush, about 18 inches from the ground. While examining it on May 31st, nine days afterwards, to ascertain the result of my work, I found in one of the folds of the bag a cocoon of *Nematus ventricosus* firmly attached to the surface of the paper. In this instance the larva must have remained unchanged during the winter, then crawled from the ground, attaching itself as related and constructing its cocoon after the 22nd of May. A few days later, I found a similar cocoon attached to the bush, which from its fresh appearance I inferred had been constructed about the same time, although I am unable to advance any positive statement regarding it. During the summer I have found a considerable number of such cocoons fastened to the

underside of the leaves of the bushes on which the larvæ have been feeding, and these have been observed in all positions from near the base to the summit of the bushes, showing that it is not the invariable practice of the larva to undergo its change to chrysalis, either at the surface or under the surface of the ground.

LIST OF COLEOPTERA,

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from page 7.)

CARABIDÆ.

PTEROSTICHUS (cont'd).	BADISTER, <i>Clairv.</i>	GEOPINUS, <i>Lec.</i>
Rejectus, <i>Lec.</i>	Pulchellus, <i>Lec.</i>	*Incrassatus, <i>Dej.</i> ¹
Adoxus, <i>Say.</i>	DICÆLUS, <i>Bon.</i>	AGONDERUS, <i>Dej.</i>
Rostratus, <i>Newm.</i>	*Simplex, <i>Dej.</i>	Lineola, <i>Fab.</i>
Chalcites, <i>Say.</i>	Elongatus, <i>Dej.</i>	Pallipes, <i>Fab.</i>
Lucublandus, <i>Say.</i>	Teter, <i>Bon.</i>	ANISODACTYLUS, <i>Dej.</i>
Erythropus, <i>Dej.</i>	Politus, <i>Dej.</i>	Rusticus, <i>Dej.</i>
Caudicalis, <i>Say.</i>	DIPLOCHILA, <i>Brul.</i>	Carbonarius, <i>Say.</i>
Corvinus, <i>Dej.</i>	Laticollis, <i>Lec.</i>	*Punctulatus, <i>Lec.</i>
Patruelis, <i>Dej.</i>	Major, <i>Lec.</i>	Harrisii, <i>Lec.</i>
*Femoralis, <i>Kirby.</i>	Impressicollis, <i>Dej.</i>	Melanopus, <i>Hald.</i>
Mutus, <i>Say.</i>	ANOMOGLOSSUS, <i>Ch.</i>	Nigrita, <i>Dej.</i>
Adstrictus, <i>Germ.</i>	Emarginatus, <i>Say.</i>	Discoideus, <i>Dej.</i>
Luczottii, <i>Dej.</i>	CHLÆNIUS, <i>Bon.</i>	Baltimorensis, <i>Say.</i>
Coracinus, <i>Newm.</i>	Lithophilus, <i>Say.</i>	*Sericeus, <i>Harris.</i>
Adjunctus, <i>Lec.</i>	Sericeus, <i>Forst.</i>	AMPHASIA, <i>Newm.</i>
Stygicus, <i>Say.</i>	*Solitarius, <i>Say.</i>	Interstitialis, <i>Say.</i>
Protensus, <i>Lec.</i>	Chlorophanus, <i>Dej.</i>	EURYTRICHUS, <i>Lec.</i>
Honestus, <i>Say.</i>	Pensylvanicus, <i>Say.</i>	*Piceus, <i>Lec.</i>
AMARA, <i>Bon.</i>	Tricolor, <i>Dej.</i>	Terminatus, <i>Say.</i>
Avida, <i>Say.</i>	Impunctifrons, <i>Say.</i>	*Agilis, <i>Dej.</i>
Angustata, <i>Say.</i>	Niger, <i>Rand.</i>	BRADYCELLUS, <i>Er.</i>
Impuncticollis, <i>Say.</i>	Tomentosus, <i>Say.</i>	*Vulpeculus, <i>Say.</i>
Fallax, <i>Lec.</i>	ATRANUS, <i>Lec.</i>	*Autumnalis, <i>Say.</i>
*Erratica, <i>Zim.</i>	*Pubescens, <i>Dej.</i>	*Arenarius, <i>Lec.</i>
Interstitialis, <i>Zim.</i>	ODES, <i>Bon.</i>	*Badiipennis, <i>Hald.</i>
Obesa, <i>Say.</i>	Fluvialis, <i>Lec.</i>	Lugubris, <i>Lec.</i>
Subaenea, <i>Lec.</i>	HAPLOCHILE, <i>Lec.</i>	Rupestris, <i>Say.</i>
LOPHOGLOSSUS, <i>Lec.</i>	Pygmæa, <i>Dej.</i>	HARPALUS, <i>Latr.</i>
Scrutator, <i>Lec.</i>		Caliginosus, <i>Fab.</i>

¹ Lake Shore, under pieces of wood.

HARPALUS (<i>continued</i>). PATROBUS , <i>Dej.</i>		BENEDIDIUM (<i>continued</i>).
Erraticus, <i>Say.</i>	Longicornis, <i>Say.</i>	Variegatum.
Amputatus, <i>Say.</i>	BEMBIDIUM , <i>Latr.</i>	Versicolor, <i>Lec.</i>
Faunus, <i>Say.</i>	Inæquale, <i>Say.</i>	*Frontale, <i>Lec.</i>
Pensylvanicus, <i>Degeer.</i>	Nitidum, <i>Kirb.</i>	Quadrимaculatum, <i>Linn</i>
Erythropus, <i>Dej.</i>	Dilatatum, <i>Lec.</i> ²	*Garinula, <i>Chaud.</i>
Pleuriticus, <i>Kirb.</i>	Chalceum, <i>Dej.</i> ²	*Wingatii, <i>Bland.</i>
Herbivagus, <i>Say.</i>	*Fugax, <i>Lec.</i>	TACHYS , <i>Zie.</i>
Varicornis, <i>Lec.</i>	Planum, <i>Hald.</i>	*Scitulus, <i>Lec.</i>
*Vagans, <i>Lec.</i>	Lucidum, <i>Lec.</i>	*Lævus, <i>Say.</i>
STENOLOPHUS , <i>Dej.</i>	Picipes, <i>Kirb.</i>	Nanus, <i>Schaum.</i>
Fuliginosus, <i>Dej.</i>	Gelidum, <i>Lec.</i>	Flavicauda, <i>Say.</i>
Conjunctus, <i>Say.</i>	*Nitens, <i>Lec.</i>	Incurvus, <i>Say.</i>
Ochropezus, <i>Say.</i>	Dorsale, <i>Say.</i>	*Pulchellus, <i>Ferte.</i>
*Dissimilis, <i>Dej.</i>	Patrule, <i>Dej.</i>	
Partiarius, <i>Say.</i>		
DYTISCIDÆ.		
HALIPUS , <i>Latr.</i>	LACOPHILUS , <i>Leach.</i>	COLYMBETES , <i>Clairv.</i>
Triopsis, <i>Say.</i>	Maculosus, <i>Say.</i>	(<i>continued</i>).
Immaculicollis, <i>Harris.</i>	COPTOTOMUS , <i>Say.</i>	Quadrимaculatus,
CNEMIDOTUS , <i>Ill.</i>	Interrogatus, <i>Aubé.</i>	(<i>Aubé.</i>)
12-Punctatus, <i>Aubé.</i>	MATUS , <i>Aubé.</i>	Picipes, <i>Kirby.</i>
HYDROPORUS , <i>Clair.</i>	*Bicarinatus, <i>Aubé.</i>	*Sinuatus, <i>Lec.</i>
Punctatus, <i>Aubé.</i>	COPELATUS , <i>Er.</i>	Sculptilis, <i>Harris.</i>
Affinis, <i>Say.</i>	*Glyphicus, <i>Lec.</i>	Binotatus, <i>Harris.</i>
*Granarius, <i>Aubé.</i>	AGABUS , <i>Leach.</i>	HYDATIUS , <i>Leach.</i>
*Consimilis, <i>Lec.</i>	*Parallelus, <i>Lec.</i>	*Basillaris, <i>Lec.</i>
*Lineolatus, <i>Lec.</i>	Punctulatus, <i>Aubé.</i>	ACILIUS , <i>Leach.</i>
Catascopium, <i>Say.</i>	*Tæniolatus, <i>Lec.</i>	Fraternus, <i>Lec.</i>
Modestus, <i>Aubé.</i>	*Semipunctatus, <i>Lec.</i>	DYTISCUS , <i>Linn.</i>
*Varians, <i>Lec.</i> ¹	*Stagninus, <i>Lec.</i>	Confluens, <i>Say.</i>
Tenebrosus, <i>Lec.</i>	*Obtusatus, <i>Lec.</i>	*Anxius, <i>Mann.</i>
*Oblitus, <i>Aubé.</i>	*Scapularis, <i>Mann.</i>	Cordieri, <i>Aubé.</i>
*Collaris, <i>Lec.</i>	Fimbriatus, <i>Lec.</i>	Fasciventris, <i>Say.</i>
*Concinnus, <i>Lec.</i>	*Ambiguus, <i>Lec.</i>	Harrisii, <i>Kirby.</i>
*Patruelis, <i>Lec.</i>	COLYMBETES , <i>Clairv.</i>	*Verticalis, <i>Say.</i>
*Nubilis, <i>Lec.</i>	Biguttulus, <i>Lec.</i>	Hybridus, <i>Aubé.</i>

* Species marked with an asterisk have not been before included in the list of Canadian Coleoptera.

¹ Taken last year in Bosanquet, but mentioned here as it has not been before included in the list of Canadian species.

² Taken at Goderich.

MISCELLANEOUS NOTES.

PARSNIP LARVA.—Mr. James Angus, of West Farms, N. Y., writes as follows respecting our notice of this insect in the last number of the *Canadian Entomologist*. "I am pleased with your description of the Parsnip Depressaria; it is an old acquaintance of mine. I have raised the larvæ and noticed their habits for many years. It seems to be very closely allied to, if not identical with, a British species, *D. heracliana*, an abdomenless specimen of which I have in my collection." On again comparing our specimens with the brief descriptions in Stainton's *Manual*, we notice a great resemblance to that of *D. heracliana*, which had not struck us before. It is not at all unlikely that our species is an imported insect, like a great many more of the farmers' and gardeners' worst pests. We shall take an early opportunity of sending some of our specimens to England in order to have the question settled, and should the insect prove to be a British species we shall gladly withdraw the name that we have given it. We have no desire to multiply names or synonyms, which are becoming such a nuisance to Entomologists, but being unable to identify our insect from any description that we had access to, we determined—with some hesitation—to give it a name which could easily be withdrawn if the species proved not to be a new one.

LARVA OF HYPERCHIRIA VARIA, Walk.—On the 25th of July last, I found closely huddled together on the underside of a Locust leaf (*Robinia pseudacacia*, L.) a cluster of fifteen small bristly caterpillars, of a dark brown colour. On opening the chip box in which they were confined, some hours after their capture, I found them ranged in a single line obliquely up and down its sides; when disturbed they set off in procession round and round the box following their leader in a most grotesque manner. After this whenever I looked at them, till they became very large, they were always either ranged in a single column, or very closely huddled together. By and by they became so large that the line of fifteen exactly measured the inner circumference of the box, and then, by dint of a little persuasion, I got them to form an endless procession around the inside of the box, each one following closely the individual before him. They went on in this way for upwards of half an hour, and looked as if they would have gone on for ever, till I thought they had had exercise enough and broke up the column. At this time their length was 0.35 inch; their general colour black; body entirely covered with long sharp compound black spines, so thickly branched on every side as to form a complete *chevaux de frise*—the terminal spinelets ended in a fine hair, the main stem being jet black, the side branches white tipped with black; along the sides there was a reddish-white line, and another of the same colour through the spiracles. In other specimens the two lateral lines and the space between them formed together a band of reddish-white.

Up to the 16th of August I did not recognise the species of these caterpillars, though I fancied they belonged to the *Saturniadae*, but on my return on the 28th, from the meeting of the American Association at Salem, I found rather to my surprise, that they had grown to be about two and a half inches long, and were of a delicate yellowish green colour with an abbreviated reddish lateral band. They had proved to be the very familiar larvæ of what is commonly known as the Io Emperor-moth of Harris (*Hyperchiria varia*, Walk.). One of them began to form his cocoon on the 7th of September, the rest are still feeding, and a prodigious quantity they eat. I have reared these larvæ before, though never from their infancy, and found them to feed on the leaves of Willow and Elm. Dr. Harris (Ins. Mass., p. 393), states that they "live on the balsam poplar and the elm, and, according to Mr. Abbot, on the dogwood or cornel and the sassafras; they feed well also on the leaves of clover and Indian corn." In his 'Entomological Correspondence,' p. 295, he states that a brood of these larvæ fed on *Robinia viscosa*. Dr. Fitch (4th Report, p. 81), gives the cherry as the food-plant, and also (5th Report, p. 52), the locust. Mrs. H. C. Freeman (Amer. Ent. i. 39), states that she found it feeding on the hop vine. It thus appears that they are by no means particular as to their diet. The imago usually appears between the 1st and 20th of June; those I bred last year and kept in the house came out in April.—C. J. S. B.

NOTES ON A FEW BEETLES.—Perhaps it may interest some of the readers of the ENTOMOLOGIST to mention that that rare beetle, *Necrophilus subterraneus*, Fab., may be found during the last of September and in the early part of October in decomposing fungus, particularly the "toadstool" species growing in clusters on decaying logs. My earliest specimen was taken on the 27th of September, the latest on October 13th.—It is probably well known to all who have taken *Haplochile pygmaea*, Dej., that it emits when handled a most unpleasant and powerful odor, exceeding that of *Chrysopa*, and requiring repeated applications of soap and water to remove it from the fingers.—*Trichodesma (Anobium) gibbosum*, Say.; of this species I dug three specimens out of a dead maple tree in Oxford, January, 1867, and early in July of the present year I obtained a number by beating the limbs of trees.—J. PETTIT, Grimsby, Ontario.

SCUDDER'S "BUTTERFLIES OF NEW ENGLAND."—I am very desirous of seeing collections of Insects from every part of New England, New York, New Jersey and the Dominion of Canada, and repeat the promise made in the spring, of naming any collection of butterflies from these districts sent by express to the address below, early in October. I beg those who can do so to send not one specimen only of a species, but as many as possible, especially

among the Hesperidæ and the genera *Lycæna*, *Thecla*, *Limenitis*, *Argynnis*, *Melitæa* and *Grapta*, where some species have for a long time been confounded. The insects should be numbered—at least with one number for a species—and where any specimen is sent, not obtained from the immediate vicinity of the sender, it should invariably be labelled with the locality where it was taken. If the collection is accompanied by the dates of capture of the different specimens, or a general table of the exact times of appearance and disappearance of the butterflies in the region where they were captured, the collection would have a double value. Specimens of the parasites of butterflies are also desired when it is known what species they attack—or the chrysalids from which the parasites have been bred can be sent; these also will be named and can probably be returned with the others.

Specimens in all cases should be pinned *strongly* in small light boxes, lined on the bottom with cork, pith, or soft wood; these boxes should then be wrapped in paper and packed in a larger box with an abundance of dry stuffing, such as crumpled paper, shavings, or coarse straw—not too tightly crowded, but so arranged as to leave from one and a half to two inches of stuffing around the *whole* interior of the outer box. If these directions are regarded little danger need be feared.

Collections sent to me by the first or middle of October next will be returned by the first or middle of the following January; for the safety, however, of my own collection, and of others entrusted to me, it will be necessary to return at once and unnamed, any collection showing traces of having been attacked by Museum pests.—SAMUEL H. SCUDDER, Boston Society of Natural History, Berkeley Street, Boston, Mass.

BOOKS RECEIVED.

Record of American Entomology for the Year 1868. Edited by A. S. Packard, jun., M.D., Salem. Naturalist's Book Agency. (Svo. pp. 60. Price \$1.)

Every American Entomologist must have felt from time to time the want of some ready means of "keeping track" of what his fellows have published in the various scientific periodicals of the day. He need now be troubled no more, as the "Record" before us is intended to supply the want year by year, and to afford a convenient index to all that is written about American insects. This first volume of, we trust, a long series, contains references to four hundred and two new species of insects from North America, and four new false scorpions, and to articles and notices by forty-five different writers. This is certainly a gratifying record, especially when it is observed that, with two exceptions, no notices are included of papers published in European journals, copies of them not having been obtained in time. In future it is intended to refer to all American papers of the current year, and to European publications of the preceding year, in order to make the "Record" as complete and useful as possible. The Editor,

Dr. Packard, has been assisted in his work by some of the leading Entomologists of the day; while he records the notices of the Hymenoptera, Lepidoptera (Heterocera) and Arachnida, Mr. Scudder takes the Lepidoptera (Rhopalocera) and Orthoptera; Baron Osten Sacken the Diptera; Dr. LeConte the Coleoptera; Mr. Uhler the Hemiptera and Neuroptera, and Dr. Hagen the Pseudo-Scorpions.

A Guide to the Study of Insects. By A. S. Packard, jun., M.D. Parts viii., June, and ix., August, 1869. Salem: Naturalists' Book Agency. (50 cents per Part.)

These two parts contain the conclusion of the Coleoptera, the whole of the Hemiptera, and the beginning of the Orthoptera. They are, as usual, copiously illustrated, containing between them nearly two hundred excellent wood-cuts. It is announced that one more part will complete the work.

First Annual Report of the Trustees of the Peabody Academy of Science Salem, Mass., 1869. 8vo. pp. 103.

Through the munificence of Mr. Peabody, of world-wide celebrity, who gave the sum of \$140,000 for the "promotion of science and useful knowledge in his native County of Essex," the Peabody Academy of Science has been founded at Salem by the amalgamation of the Essex Institute and the old East India Marine Society. The new Academy was inaugurated in a befitting manner during the recent meeting of the American Association at Salem, and has now entered upon, we trust, a long career of usefulness and prosperity. The report before us sets forth all the particulars respecting the foundation of the Academy and the formation of its admirable museum, and includes interesting and valuable reports by the Director (F. W. Putnam) and the Curators, who are widely known as the joint Editors of the *American Naturalist*. Dr. Packard adds a list, with descriptions of new species, of the Hymenopterous and Lepidopterous insects collected by the Smithsonian Expedition to South America under Prof. Orton; and Mr. Morse, a description of a new shell (*Actinobolus*) taken in Essex County. The "proposed plan of operations" submitted by the Director and Curators is well worth the consideration of all connected with similar institutions, and might be advantageously followed by our own "Canadian Institute" at Toronto. Would that some of our men of wealth could be induced to take an interest in this institution, and place it in a permanent and efficient condition, so as to enable it to accomplish for this Province what the Peabody Academy is now doing for its own County of Essex.

The Canadian Naturalist. New Series, Vol. iv., No. 2, June 1869. Montreal: Dawson Brothers. (\$3 per vol.)

We are glad to hear that this long-established Journal has now been placed upon a new footing, and is likely to be issued with regularity. Instead of appearing bi-monthly as before, it is now to be issued quarterly, though with the same amount of matter as formerly in the volume; it is to be conducted by an editing committee of members of the Natural History Society of Montreal, and is to include a larger field of popular science than before. The number before us

contains many interesting articles in various departments of science, including one in our branch of Natural History, viz., "The Toad as an Entomologist," by A. S. Ritchie. The writer advocates the slaughter of toads in the early morning for the purpose of obtaining the specimens of insects they had swallowed during the night! This appears to us a horrible mode of collecting, and judging from the few rarities obtained a most needlessly cruel operation. The results derived from the murder of the poor toads do not tend so much to the advancement of science as to justify the shedding of their innocent blood. We hardly fancy the example will be widely followed—the very thought of ripping up some wretched toads before breakfast in the morning to get at the beetles inside, makes one's blood run cold!

The American Entomologist. An illustrated Magazine devoted to practical and popular Entomology. St. Louis, Mo., Vol. i., No. 12, August 1869.

This excellent publication has now come to the end of its first volume, and is to appear henceforth in a new and improved style, with an ornamental wrapper, on better paper, with an increased number of pages, and at a doubled price. The August number, which contains a splendid coloured plate of *Cerotocampa regalis*, affords a sample of the new dress and other improvements.

The American Naturalist. Salem, Mass. Vol. iii., No. 7, September, 1869.

As interesting and attractive as ever.

Le Naturaliste Canadien. Quebec, August, 1869. Contains a description and figure of a new Hemipteron, *Nabis Canadensis*, Provancher.

The American Agriculturist. New York, September, 1869.

Newman's Entomologist. London, Eng., Nos. 67 and 68. From Mr. Reeks.

The former number contains an interesting account of an undescribed light-giving Coleopterous larva from Brazil.

Hardwicke's Science-Gossip. London, August 1, 1869.

The Canada Farmer. Toronto, August 15, 1869.

The New York Sun. New York.

The Maine Farmer. Augusta, Me.

The Orthoptera of the State of Maine, and Notes on American Cancroid Crustacea. By Sidney I. Smith.

Contributions to Zoology from the Museum of Yale College. No. 1, by A. E. Verrill, and No. 2, by S. I. Smith.

Entomological Notes. Part II. By S. H. Scudder. 48 pages, 8vo. Boston, 1869. These notes contain a number of valuable papers on Orthoptera, and an account of some diurnal Lepidoptera from Alaska.

TO CORRESPONDENTS.

SUBSCRIPTIONS RECEIVED.—To Vol. II.: From J. A., Brooklyn; J. A., Wes Farms; G. W. P., New York (with *Am. Ent.*); A. J. C., Lansing (Ditto); E. B., Boston; W. W. B., Indianapolis; Rev. Dr. D., Baltimore (Vols. I. and II. and *Am. Ent.*); J. G. M., Baltimore (Vols. I. and II.); C. E. II., Waterville, Me.

REV. F. O. MORRIS.—Dr. Butterfield, who has returned from California to his former address, writes that several months ago he received a letter from you stating that a box of insects had been sent to him, but he has never heard anything further respecting them. He will make enquiries in the proper quarter.

F. W., Wanstead, Eng.—C. B. M., Lep. Heteroc., Part xx., *Geometrites*, received; also, per Smiths. Inst., a copy of your "Catalogue of the Homopterous Insects collected in the Indian Archipelago, etc.," and two boxes of specimens. For all of which please accept our best thanks.

SUBSCRIBERS are respectfully reminded that their subscriptions to Vol. II. of the CANADIAN ENTOMOLOGIST are now due.

LEPIDOPTERA.—I have obtained from pupæ of last season a good supply of *Cerotocampa regalis*, *Eacles imperialis*, and that rarity *Sphinx jasmineearum*. There are several species of Sphinx and Catocala that I am anxious to obtain, especially a good ♂ *C. relictæ*.—JAMES ANGUS, West Farms, N. Y.

ARCTIA PARTHENOS is very much enquired after; any collector who has obtained duplicates of this rare species will do well to communicate the fact.

LEPIDOPTERA FOR SALE.—A friend has a very fine collection of N. American Lepidoptera, including rare Sphingidæ, which he wishes to dispose of. They are in perfect condition, and many of them rare. For particulars apply to Geo. W. PECK, 129 Maiden Lane, New York. (Adv.)

ENTOMOLOGICAL PINS.—The long expected supply of pins has at length arrived; they were delayed, it appears, by the illness of M. Klæger, the manufacturer. By some, at present, unaccountable mistake, only half the order has been filled, and we have received to our great disappointment merely the coarser sizes. We have thus plenty of Nos. 4, 5 and 6, but none of 1, 2 or 3. The price is \$1 per thousand (\$1.25 in U. S. currency). No. 4, in packets of 500, at 50c. each; Nos. 5 and 6, in packets of 250, at 25c. each. Parties ordering will please state whether they wish them sent by mail or express.

CLUB RATES.—We beg to direct the attention of our readers, who are now renewing their subscriptions, to the following advantageous club rates that we are enabled to offer them:

THE AMERICAN NATURALIST (\$4) and the CANADIAN ENTOMOLOGIST (\$1) for three dollars and a half per volume (\$4.50 in U. S. currency).

THE AMERICAN ENTOMOLOGIST (\$2) and the CANADIAN ENTOMOLOGIST (\$1) for two dollars per volume (\$2.50 in U. S. currency).

Those who desire to take advantage of these terms will please inform us as soon as possible, that we may be enabled to complete our lists.

The Canadian Entomologist.

VOL. II. TORONTO, NOVEMBER 15, 1869. No. 3.

THE GRAPE-SEED INSECT.

(*Isosoma vitis*, n. sp.)

BY W. SAUNDERS.

In Vol. i., No 3, page 20, of the *Canadian Entomologist*, I published a description of a larva found infesting the seed of the grape, and in the *Canada Farmer* for October 15, 1868, page 316, a fuller description of its habits and destructive powers, and ventured the opinion that it would probably produce, when mature, a small curculio. In this I was in error, for the perfect insect proves to be Hymenopterous, a small four-winged fly belonging to *Isosoma*, and as it is believed to be undescribed, I propose for it the name of *vitis* (*Isosoma vitis*, n. sp.). The following notes on its history were made subsequent to the date of the issue referred to.

In October I detached a larva from the inside of the seed, and placed it in a small glass cell between two plates of glass, in which state it remained until early in January, when it became a chrysalis, having first attached itself to the sides of the cell by a few short silky threads. It had now contracted in length, become nearly oval, and assumed a yellowish tint, with a few short loose silky threads adhering to different parts of its surface. On the 11th of February I examined some seeds and found the larva within still alive and active, just as it appeared in the fall. On the 7th of July further specimens were opened and the inmates found soft and motionless, these appeared to be in the chrysalis state, but I did not examine them with sufficient care to enable me to be positive. During the remaining part of July I looked many times into the bottles in which the grapes were enclosed but could not discover anything. On the 9th of August, feeling sure that the time for the appearance of the insect must be fully come, if not already past, I resolved on a thorough search for it. As soon as the contents of the bottles had been emptied on a piece of white paper, I observed a number of small four-winged flies among the dried-up grapes. They were all dead and stiff, some of them more brittle than others. From the observations made I should judge that they made their escape from the middle to the end of

July. The following is a description of the female described from seven specimens.

ISOSOMA VITIS, ♀ n. sp.—Expands about one-sixth of an inch. Head large, flattened in front, black, thickly punctured, and covered with many short whitish hairs; mandibles pale brown at base, tipped with black; antennæ black, thickly covered with whitish hairs, nine jointed, inserted in deep sockets; the first joint pale brown, more slender than the others, very long, nearly as long as the three following, the second short, third to eighth inclusive nearly equal in length, the terminal joint longer, tapering slightly towards the tip. Thorax black, punctured, and covered with whitish hairs.

Wings clear, iridescent, venation simple, consisting of a single vein. On primaries the basal portion of this vein runs a little above the middle of wing, when less than half way towards the apex it is curved to the costal margin where it is thickened, and runs parallel with the edge a short distance; then dividing, one portion extends somewhat further along the edge of the wing, lessening in thickness towards its extremity, the other with a short outward curve terminates a little within the costal margin, and is widened at the tip. There is a slight dusiness about the inner portion of these branches, extending back to near the point where the vein first joins the costal edge.

The basal portion of vein on secondaries is thickest, and is coalescent with the costal margin for nearly one-third of its length, then contracting in size it turns inwards another third towards the middle of wing,—the terminal third increasing in size, extends to the costal margin, and runs a short distance parallel with it, the whole vein extending little more than half the length of wing. Both veins are sprinkled with many minute black dots, from which arise short black hairs; they are also partially fringed with hairs.

Abdomen long, black, straight smooth with a polished surface, placed on a short pedicel—the first ring very narrow, second and third a little wider and nearly equal in size, the fourth fully as wide as the three preceeding, fifth less than half the width of fourth, sixth a little shorter, terminal ring somewhat longer. The abdomen is a little contracted at its anterior extremity thickest on the third ring, lessening gradually in size till it reaches the last two segments, which are suddenly contracted, the terminal one ending in a point, with a few whitish hairs about and near the top. Anterior pair of feet pale brown, trochanters nearly black, second and third pairs have the trochanters black, femur and tibia nearly black along the middle, pale brown at each extremity, tarsi pale brown.

The male differs from the female in having the joints of the antennæ somewhat longer and more thickly covered with hairs; the hairs are also longer;

the abdomen is short, thick, and blunt, placed on a moderately stout pedicel nearly its own length. The abdominal rings have about the same relative size as in the female, but the posterior edge of third overhangs the fourth, the latter appearing as if partially drawn within the projecting edge of third ring.

I am indebted to my esteemed friend, Chas. V. Riley, State Entomologist of Missouri, for the correct placing of this insect, and would refer those who desire further information on this and other closely allied genera, to a valuable paper by the Senior Editor of the *American Entomologist*, in that interesting periodical, Vol. I., No. 8, illustrated by excellent figures, from accurate drawings made by the Junior Editor.

Having kept the grapes in bottles, only occasionally opened for ventilation, in a dry room, they had become quite hard, dry and shrivelled. In consequence of this many of the flies were unable to make their way out, the seed having become too hard for their jaws to eat through. On opening some of these the flies were found dead with wings fully developed and surrounded by small fragments of the interior coating of the seed which they had evidently gnawed off while endeavouring to escape. Those which had found their way out had eaten a small nearly round irregular hole through seed and skin. In many similar cases where the larva feeds within a hard substance it provides for the escape of the perfect insect by eating away the hard enclosure until it is reduced so thin as to appear almost transparent, then a very little effort is sufficient to remove the obstruction to the outward passage of the imago. In this instance I have been unable to detect any such preparation, and believe that the whole work of escape is accomplished by the perfect fly.

Notwithstanding the abundance of this insect last year, I have as yet been unable to detect their presence or any evidence of their work during the present season, probably the cold and wet character of the summer has been unfavorable to their operations.

BRIEF NOTES ON THE TRANSFORMATIONS OF SEVERAL SPECIES OF LEPIDOPTERA.

BY CHAS. S. MINOT, BOSTON, MASS.

1. *Actias Luna*.—Eggs laid at night by a female in confinement, on April 30th, (this is an exceptional case, they are not generally laid until June.) They are lateriform, obrotundate, smooth, approaching in some cases a spheroid, opaque, very dark sepia with a faint tinge of olivaceous, though some specimens were marked with broad white bands irregularly disposed, and a very few almost entirely white.

2. *Ceratonia Amyntor* Hübn, (*Quadricornis* Harr.)—Eggs sub-spheroid, hyaline, very light yellowish green, without corrugations or striæ, highly luteous. Laid on the 9th of June—hatched on the 19th. Larva just hatched, .18 inch, elongated, attenuate, swelling at each extremity, the thoracic diameter being the greatest; colour yellowish-green; anal horn .09 inch—acuminate and black. After the first moult it assumes the appearance of the full-grown larvæ in everything excepting size. It moulted six times; full-grown specimens being seen in September.

3. *Mamestra Arctica* Boisd.—Eggs laid June 13th. Form above circular, tapering towards the apex, flattened at the base; transverse diameter less than longitudinal; luteous, pale yellowish-green: a cordate impression upon the slightly flattened apex; a little smaller than the eggs of *Chrysophanus Epiranthe*. They hatched while I was not at home, and therefore I am unable to give any farther account of the metamorphoses of the insect.

4. *Tetracis lorata* Grote.—From two females confined in a box, I obtained on June 18th-20th over three hundred eggs. These are subovate, slightly flattened at the larger end, varnished. From 15 to 40 eggs are laid at a time, during the night only; they are deposited about 100 in one spot, in curving, sometimes angulated rows, which have the appearance somewhat of radiating from a common centre. When first laid they were yellowish-green; on the 20th they had become ochra-olivaceous; on the 21st indian red, and by the 28th or 29th the greater part appeared gray, which effect was caused by innumerable minute black atoms on a whitish ground. On the 31st they were all a deep, though rather dull purple. Hatched on the 30th and 31st. Some of the larvæ lived until July 7th. Head several times larger than the prothorax, ochraceous, luteous, sub-globose; anal segment much enlarged, white; prolegs, two pairs, white. The enormous head and anal segments gave these caterpillars the appearance of minute, animated dumb bells. Above, fuliginous; stigmatal line, white; beneath, palè red. They were very active, almost constantly in motion. Each time before looping, it rears itself up on its hind legs, and turns round in every direction, as if scrutinizing the neighbourhood. I tried in vain to rear them, experimenting with almost every food plant I could think of.

The changes the eggs went through are most remarkable and interesting. I have been unable to learn of anything at all equal to it. If any of the readers of this journal know of any parallel case, or have any explanation to offer as to these extraordinary alterations of the colour, I should be very glad to hear from them.

5. ————— Mr. Scudder has in his collection the larval stage of an insect closely allied to this, both he and Dr. Packard

are at a loss to assign it to its systematic position ; they also agree in considering it not to be *Rhopaloceros*. The eggs were laid on a currant leaf, and were received by me through Mr. Scudder after a three days journey. The following description was made soon after I received them, July 18th. Long. diam. .07, trans. diam. .05 inch. Top-shaped, tapering towards the apex, where they were slightly flattened ; sides much compressed, lacteous, sordid, with a large jet spot on each of the compressed sides, and a black dot above. Just before hatching, the spots disappear, the ground colour becomes pale lemon yellow, and the shell is luteous. Larvæ appeared on the 29th.; the first act of their existence was to eat the egg-shells entirely, except the basal part by which they were glued to the leaf. When two days old, these caterpillars are one-sixteenth of an inch long ; head large, perpendicular, top-shaped, reddish-brown, luteous ; eyes black, shining ; mouth small, jaws not powerful ; body tapering towards urite, above yellowish-brown, lighter underneath, very distinctly separated along the stigmatal line from the darker shade of the upper surface. Above, on each segment four black spines, branching thus—first a stout pedicel, branched like a Y, the inner branch being shorter than the outer, both divarications ending in four setoid appendages, three very short, and the fourth and exterior one as long as the rest of the spine and curving like that portion of an ellipse which would be included between two adjacent points of the intersections of the transverse and longitudinal axes with its circumference. These spines are .05 inch long. Whenever they move they march in single file. From several experiments I made, I am satisfied that they have no certain leader in moving. Their eyes seem to be useless, for they did not appear to perceive any difference between light and darkness, the leader seeming to feel his way along in a manner very unusual for larvæ, and those behind having each a very delicate silken thread about the length of the head of the larvæ, which attaches it to the one in front. There are prop-legs on the 2nd., 3rd, 4th., 5th and last abdominal segments.

ENTOMOLOGY AT HELLMUTH COLLEGE.

At the request of the Head Master, the Rev. A. Sweatman, I recently accompanied my friend, Mr. W. Saunders, to the college, to adjudicate the prizes given for the collections of native insects, made by the boys during the summer vacation. Considering that this is the first effort of the school at entomology the result is most gratifying, and I feel sure that some slight notice of these collections will be of interest to the readers of the *Entomologist*.

The first prize, value \$15, was awarded to William Hugh Wood, who resides in Walsingham, in the county of Norfolk, and contained representa-

tives of Lepidoptera, Coleoptera, Orthoptera, Hemiptera, Diptera, Neuroptera, and Hymenoptera, embracing about 140 different species, amongst which we noticed in Lep., *Heteropterus marginatus*, *Catocala epione*, *Darapsa chærilus*, Homoptera *lunata*, and a very handsome *Catocala* quite new to us, with a distinct white spot in each forewing; in Col., *Dytiscus verticalis*, *Carabus sylvosus*, *Toxotus decoloratus*, *Telephorus rotundicollis*, *Necrophorus Pustulata*, and *Tomoxia*———; also two new species of Neuroptera. This collection is very good, and reflects great credit on the industry and perserverance of Master Wood.

The second prize, value \$5, was gained by Wm. G. Hodgins, of Toronto. This was a fair collection containing some 90 species, but bore traces of having been somewhat augmented from the collection of a tolerably experienced entomologist.

Other collections were exhibited by Messrs. R. D. Bourke, and R. Dewar, of London, and J. R. C. Dobbs, of Portsmouth, and although these last named boys obtained no prizes, they are entitled to some praise for their efforts. These collections are given to the school to form the nucleus of the school collection, and in a very short time I expect to see the cabinet well stocked.

I may add that the Head Master takes a great personal interest in our Society, and is giving the boys every encouragement to develope their tastes in this and all other branches of natural history.—E. B. REED, London, Ont.

DESCRIPTION OF LARVA OF CATOCALA POLYGAMA, GUEN.

BY E. B. REED, LONDON, ONT

Taken at Port Stanley, Ont., July 1, 1869, feeding on Thorn.

Length, $1\frac{4}{5}$ inches; body cylindrical inclined to onisciform.

Head, flat, bilobed and horned or notched, dark brownish red with several long hairs just above the mandibles and collar.

Body, plump, smooth and firm to the touch; color, greenish grey with small spots and blotches: on the seventh segment, two lateral black spots; on the eight segment, a small fleshy dark coloured horn curved backwards; the anal segment terminated by two elongated prolegs; on each segment are two dorsal spots or pimples with one long hair in each; a thick fringe of greyish hair on the base of the sides; the spiracles blackish not distinctly marked.

Under side, greenish white, with a central row of blackish spots, largest in the centre of the body, and growing smaller towards each end.

Feet, grey; prolegs greenish gray.

This description was made July 7, and the larva commenced going into chrysalis the same evening.

A slight cocoon was formed by drawing together two leaves of thorn, to one end of which the larva attached itself by a few threads of silk. Length of pupa $\frac{1}{10}$ of an inch : greatest breadth $\frac{1}{4}$ of an inch ; the colour at first light reddish brown, becoming dark on the 4th or 5th day, the whole covered with a plum-like bloom ; the tongue and wing cases very clearly defined ; head case blunt ; the imago was produced July 29, after about 21 days ; its alar expansion was $1\frac{7}{10}$ inch.

As far as I can ascertain this is the first time this larva has been described. I have taken it before but failed to describe or rear it.

THE IMPORTED CURRANT WORM FLY (*Nematus ventricosus*, Klug.) AND ITS PARASITE (*Hemiteles nemativorus*, Walsh).

BY BENJ. D. WALSH, M.A.

I wish to correct a few mistakes which I have made in the paper on this subject, which was published in the ENTOMOLOGIST, Vol. II., No. 2.

1st. I have said that "not a single American species of *Hemiteles*, so far as I am aware, has as yet been described under that generic name as occurring north of the West India Islands." This is incorrect. Mr. Riley, in his Missouri Report, has described two species, viz., *H. thyridopteryx* ♂ ♀, and *H. Cressonii* ♂, as found in his State.

2nd. In *H. thyridopteryx*, Riley—in which I have now seen Mr. Riley's own specimens ♂ ♀—the metathorax of ♀ is strongly thorned, while that of ♂ is unarmed. It is the same with *H. incertus*, Cresson, though I had overlooked the fact from Mr. Cresson's diagnosis giving the thorns as a *specific*, and not as a *sexual* ♀ character. These two are the only described N. A. *Hemiteles*, where both sexes are known, and the ♀ has thorns on the metathorax : and there is no described ♂ that has these thorns, though I have one such ♂ in my collection. Moreover, in Gravenhorst's genus *Hoplismenus*, which scarcely differs from *Cryptus*, except by the presence of these thorns, the ♂ ♂, according to Brullé, have the metathorax unarmed, while that of ♀ is strongly thorned (*Hymen.* IV. p. 186). Consequently we may infer, with a reasonable degree of probability, that in *Hemiteles* these thorns very frequently, but not always, form a sexual character peculiar to ♀. This is a remarkable and somewhat anomalous fact, because in *Ichneumon morulus*, Say, the ♀ only of which is described by Say, but of which I possess two ♂, I find that the metathoracic thorns are equally well developed in either sex.

3rd. In *H. thyridopteryx*, Riley, the ♀ has the front wings bifasciate with fuscous, and the ♂ has them hyaline. In *H. incertus* Cresson, the front wings of ♀ are fuscous, and those of ♂ hyaline bifasciate with fuscous. And there is no other described N. A. ♂ with fasciate or bifasciate wings,

nor have I any such in my collection. Hence we may infer that usually, when *Hemiteles* ♀ ♀ have the front wings entirely fuscous or banded with fuscous, the ♂ ♂ will respectively have them either banded with fuscous or entirely hyaline. Such colorational sexual characters, though very unusual, are yet not without their parallel in other orders of insects. For instance in *Myodites Walshii*, Lec. (*Coleoptera*), the wings of ♂ are hyaline, and those of ♀ strongly fasciate with fuscous. Conversely in the European *Potamanthus marginatus*, Zetterst. (*Pseudo-neuroptera*), as I am informed by Dr. Hagen, the front wings of ♂ are tipped with fuscous, and those of ♀ are hyaline immaculate.

4th. Since then in *Hemiteles* metathoracic thorns and fasciate wings, when present—which is by no means universally the case—are usually not a specific but a mere sexual ♀ character, the Synoptical Table which I have given for this genus must be considered as applying exclusively to the ♀ sex.

We may observe here that the body of *H. thyridopteryx* ♂ is very notably darker-colored than that of ♀. This is the only exception with which I am acquainted to a general colorational law which I have laid down, namely, that in *Ichneumonidæ*, when sexual differences prevail as to the coloration, the ♂ body is almost universally lighter-colored than that of ♀; whereas in *Tenthredinidæ* the converse rule holds good very generally (*Proc. Ent. Soc. Phil.* VI., p. 239). Until I saw with my own eyes Mr. Riley's specimens, I rather inclined to believe that he must have made some mistake in referring his ♂ ♀ to the same species. The ♂ of *H. thyridopteryx* is further extremely remarkable for having the stigma perfectly hyaline—a peculiarity which I do not remember to have noticed in any other *Ichneumon* Fly.

While on this subject I may add, that I do not quite see the force of Mr. Saunders' inferences (*Can. Entom.* II., p. 16) as to the occasional hybernation of the Currant Worm in the larva state. In N. W. New York,—which lies in nearly the same latitude as London, C. W.—this Saw-fly comes out of the ground from the latter part of April to the fore part of May, and the female oviposits shortly afterwards. The earliest flies produced from this laying of eggs appearing about the last week in June. I can see no reason, therefore, why a larva might not have hatched out from the egg in London, C. W., in the first week of May, 1869, spun up on Mr. Saunders' paper bag on May 30, 1869, and the cocoon been noticed by that gentleman for the first time, as he informs us, on May 31st, 1869. Yet Mr. Saunders from these data arrives at the conclusion that such a larva "must have remained unchanged during the winter, and constructed its cocoon after the 22nd of May." In most insects that hybernate under ground there is a considerable variation in the time at which the imago state is assumed in the

following spring; and of course the earliest females will lay the earliest eggs and produce the earliest groups of young larvæ.

The Heteropterous larvæ described by Mr. Saunders (p. 15) as attacking the Currant Worms were not, as he supposes, those of *Steretrus fimbriatus*, Say., which are quite different, but those of some species of *Arma*—perhaps *Spinosa*, Dallas, or *Modesta*, Dallas, or a species closely allied to *Modesta*, which I have found to live in the larval and pupal states in the nests of the Fall Web Worm (*Hyphantria textor*, Harris), preying voraciously upon the inhabitants thereof.

The reader will kindly please to correct the following slips of the pen in the paper to which this forms a sequel:

Page 10, line 2, for "latter" read "former."

" 10, " 11, " "13" " "14."

NOTES ON HADENA XYLINOIDES.

BY W. SAUNDERS, LONDON. ONT.

On the 17th of June I captured a female specimen of *Hadena xylinoides*, early in the evening on a sugar cask. Having confined it in a pill box I laid it aside and did not examine it again until the 20th, when it was observed that a number of eggs had been deposited. These, although examined casually by the microscope, I neglected taking a minute description of. They were about medium size, of a flattened conical form, greenish in color, and ornamented with many striæ. The eggs hatched on the 24th of June, when the following description of the young larva as seen under a common eye-glass was taken:—

Length 0.12 in., cylindrical. Head rather large, bilobed, black and shining. Body above green and glossy, semi-transparent, with a number of raised brownish dots on each segment, from every one of which arises a brown hair. Second and terminal segments have each a patch of brownish black above under surface similar to upper. Feet blackish brown; prolegs green tipped with brown.

The middle part of body is arched when walking, the motion resembling that of a *Catocala*; the anterior pair of prolegs do not appear to be used in progression. The general appearance, glossiness and semi-transparency of skin reminds one of a Saw-fly larva.

Between the first and second moult another description of the larva was taken. Length 0.32 inch. Head small, bilobed, pale brownish, very transparent.

Body above dull greenish brown along the middle with a reddish tinge at each extremity. 2nd segment above similar in appearance to head. A pale

whitish dorsal line, and a lateral line of the same hue about half way between dorsal line and spiracles. Close to under surface is a faint double whitish line enlarged to a whitish patch at each extremity. 12th segment slightly raised.

Under surface dark dull green along the middle of body; paler with a reddish tinge about each extremity. Feet dark brown; prolegs pale greenish.

After the second moult, July 2nd, the body became much darker in color, and other striking changes were apparent. The head was much larger, and the smooth polished appearance of second segment had almost disappeared. The body above was dull blackish green, almost black on sides, while the whitish lines were about the same as before. From the upper lateral line to the dorsal were oblique blackish brown lines meeting on the hinder part of each segment.

On the underside, the 5th, 6th and 7th segments were black with a polished surface, while on the other segments the color was dull blackish green.

I found these creatures quite omnivorous in their appetite, they would feed on almost any green thing, but I fed them chiefly on dandelion leaves and lamb's quarter (*Chenopodium album*). Having kept them rather closely shut up and crowded they were attacked soon after the second moult by violent diarrhoea, which although I gave them more room and ventilation soon proved fatal to them all. A fortunate circumstance enables me to complete the history of this insect.

On the 5th July, while visiting a friend's garden, I observed a larva feeding on Scabious, which proved to be a nearly full-grown specimen of *Xylinoidea*. The following is its description:—Length $1\frac{1}{2}$ inches, nearly cylindrical. Head rather small, flat in front, blackish brown and shining, with a few minute hairs scarcely visible without a magnifier.

Body above black, with a tinge of brown; a broken bluish dorsal line. On each side, close to under surface, is a stripe of brown slightly glossy, dotted with minute bluish white specks appearing like a bloom on the surface. A short whitish yellow lateral stripe on second and part of third segments, and the same on the outer edge of terminal prolegs.

Under surface brown, of the same shade as the lateral stripes above, with a similar bloom. Feet brown and shining; prolegs pale shining brown within, marked with black without.

This larva entered the chrysalis state about the middle of July, forming a rough outer case of leaves, fastened to the cover of the box in which it was confined by silken threads; within this the brown chrysalis was enclosed. The imago appeared on the second of August.

I have also found the chrysalis of this species attached to the under-side of a log early in May.

ENTOMOLOGICAL SOCIETY OF CANADA.

ANNUAL GENERAL MEETING.

The Annual General Meeting of the Society was held, by invitation of the London Branch, in their rooms, City Hall, London, Ont., on Wednesday, the 22nd of Sept. 1869, at 7 30 p.m. William Saunders, Esq., Vice-President, occupied the chair. Owing to the varied attractions and engagements, caused by the Provincial Exhibition then being held, the attendance of members was not large.

The Secretary-Treasurer read the minutes of the last meeting, the financial report, and a detailed statement of the condition, present success, and prospects of the CANADIAN ENTOMOLOGIST; on motion they were adopted. Letters of apology for non-attendance from the President, Prof. Croft, Mr. W. Couper, and others, were read, as well as various other communications.

President.—Professor CROFT, D.C.L., University of Toronto.

Vice-Presidents.—E. BAYNES REED, London; B. BILLINGS, Ottawa.

Ex officio Vice-Presidents.—Rev. O. BRUNET, President, Quebec Branch; Rev. G. M. INNES, President, London Branch.

Secretary-Treasurer.—Rev. C. J. S. BETHUNE, M.A. Credit, Ont.

Curator.—W. OSLER, B.A., Toronto.

Council.—J. PETTIT, Grimsby; G. J. BOWLES, Secretary, Quebec Branch; W. COUPER, Ottawa.

The following gentlemen were elected Honorary Members:—

Baron R. Von Osten Sacken, Russian Consul General, New York.

Dr. Herman Hagen, Museum of Comparative Zoology, Cambridge, Mass.

Dr. Asa Fitch, State Entomologist of New York.

And the following Corresponding Members:—

Rev. J. G. Morris, D.D., Baltimore, Md.

F. G. Sanborn, Boston Society of Natural History, Boston, Mass.

W. S. M. D'Urban, Albert Memorial Museum, Exeter, England.

The meeting then proceeded to the examination of many rare and interesting specimens exhibited by various members; amongst the most note-worthy may be mentioned a fine specimen of *Catocala relictæ*, Walk., taken at Hamilton, by Mr. Mills; *Philumpelus pandorus*, Walk., (*satellitæ* Harris) raised from larvæ by Mr. Saunders and Mr. Denton; *Catocala polygama*, Guén., from larvæ, by Mr. Reed. Mr. Saunders also exhibited specimens raised from larvæ, of *Thecla inornata*, Grote and Rob.; *Plusia balluca*, Gey., from the hop; a handsome *Tortrix* from thorn, a small species of leaf-roller that is very destructive to pear, plum, cherry and apple trees, specimens of *Nemato-campa filamentaria*, Guén. from pear and willow, etc. Mr. Bethune exhibited a collection of *Cicindelidæ*, embracing nearly all the known Canadian

species, several from the United States, and two from Switzerland; some remarkable Australian Hymenoptera and Coleoptera, recently sent out by Mr. Walker; and a number of duplicate Coleoptera which were distributed amongst the members present. Mr. Reed exhibited many interesting specimens of Lepidoptera, including several bred from larvæ.

After spending a few pleasant hours examining specimens and comparing notes, the meeting adjourned.

MISCELLANEOUS NOTES.

EXTENSION OF HABITAT OF *PIERIS RAPÆ*, LINN.—On the 1st of October I captured a specimen of *P. rapæ*, Linn., on flowers in a salt marsh on the New Jersey side of the Hudson River, less than a mile from this city. It in nowise differed from a European specimen in my collection. This, I believe, is the most southerly point from which the appearance of this butterfly has been yet recorded.—THEODORE L. MEAD, New York.

PIERIS RAPÆ.—The larvæ of this insect were very abundant and injurious this year about Montreal; here they were not numerous, and therefore did little damage.—G. J. BOWLES, Quebec.

MELITÆA PHAETON, CRAM.—I am glad to be able to inform you that I have a brood of *M. phæton* feeding. They were found by Mr. J. L. Mead, of New York, who has spent some time here this season. He found them within close webs which were attached to *Chelone glabra*, and sometimes to other plants, as Iron-weed [*Veronica*] and a *Solidago*. In one instance a web was attached to the two last named. The larvæ which I have feed on *Chelone*; they appear to feed at night, and during the day collect in dense clusters in the corner of the box in which they live. They are now half an inch long, and marked much as the mature specimens.

Mr. Mead has found the larvæ of another species of *Melitæa*, quite black, and lying—without a web—upon the under side of the leaves of the plant, a specimen of which I enclose with this. [The plant has been kindly determined for us by Prof. Macoun, of Belleville, as the "*Actinomeris squarrosa*, Nutt.; a tall branching plant from 4 to 8 feet high, with the stem winged above. It is common on the western Prairies."] These larvæ are difficult to rear, and probably will not be brought to chrysalis state this season. I suppose them to be *M. tharos*, or one of the allied small species.—W. H. EDWARDS, Coalburgh, West Va., September 16th, 1869.

LARVÆ ON *CENOTHERA*.—I was intending to write to you and to Mr. Saunders to-day about the larvæ on the *Cenothera*, when No. I. of the CAN. ENT. came to hand. I had been watching them for some days and trying to

rear them, as I suspected they were the larvæ of *Alaria florida*, Guén. But I am somewhat puzzled; I have not found the green caterpillar on the leaves but always on the buds with its head buried, eating into the bud from the outside, and I could not make out whence the animal came; but Mr. Saunders seems to have found it on the leaves. On examining some of the buds which had a hole in them, and apparently the worm attacks only those just about to blossom, I found on the inside a worm about one-third of the size of the green one; more of a grey colour and marked almost exactly the same, only much more distinctly,—at least it seems so to me. I did not find this worm in all. Now in what relation do these stand to each other, or are they quite different? The *Alaria* seems fond of sweet-scented flowers; the only one I had ever taken before this year was on the *Datura Africana*, the perfume of which is almost overpowering.—HENRY CROFT, Univ. College, Toronto, August 16th, 1869. [In reference to the above, which was crowded out of our last issue, Mr. Saunders states that he had also observed this smaller larva in seed pods of *Oenothera* for the first time a few days before the date of Prof. Croft's letter. It was very similar in colour to the larva of *A. florida*, but quite distinct, being *very small*. He has some of them now in chrysalis only quarter of an inch long. He adds that he did not usually find his specimens of *Alaria* feeding on the leaves, but generally with their heads buried in the flower buds, as described by Prof. Croft; he fed them, however, on both leaves and buds in captivity.—Ed.]

COLLECTING GROUND ON LAKE SUPERIOR.—Pie Island in Thunder Bay, Lake Superior, is the best place I know of for Coleoptera. Should any Entomologist go to Thunder Bay, let him by all means visit Pie Island. I am sure I observed 100 species that were new to me when on it, but unfortunately I had no means of collecting.—JOHN MACOUN, Belleville.

CAPTURES.—*Eudamus tityrus*, Sm. Abb. On July 9th, 1869, I captured a fine specimen of this handsome butterfly under an Acacia tree (*Robinia*) on one of our most crowded streets; it had evidently just emerged from the pupa state, for I caught it with ease in a pill box. This is the second time only that this insect has been taken in London; the former specimen, caught also on an Acacia tree, is in my cabinet.

Cossus plagiatus, Walk. (*Xyleutes* of Hübner, according to Grote).—A good specimen, slightly beaten, was brought to me early in July. I think this is the first time it has been taken here.

Callimorpha interrupto-marginata, Beauv.—On July 21st a fine female of this rare insect was brought in to me; it laid a large number of eggs, which, however, failed to produce larvæ. This is a beautiful moth, and

when its wings are folded presents a very extraordinary sight with its distinctly marked cross, which gives it a truly orthodox appearance.

Thecla inorata, Grote & Rob.—I reared some half dozen specimens from larvæ taken on oak.—E. B. REED, London, Ontario.

CAPTURES.—During my stay in Goderich I had hardly the average success. The following is a list of the rarities I have been able to find the names of:—*Cymindis reflexa*, Lec.; *Desmocerus palliatus*, Forst.; *Clytus erythrocephalus*, Oliv.; *C. speciosus*, Say; *Microhophala interrupta*, and *Epicauta vittata*, Fab.; and of Lepidoptera, *Alypia Langtonii*, Couper; and two species of *Ægeria* which are new to me.—N. H. COWDRY, Stratford, Ontario.

LUMINOUS LARVÆ.—I send you specimens of luminous larvæ which were plentiful here in August, 1868; they were given me by a gentleman who found them on the Island of Orleans. Can you tell me what they are?—G. J. BOWLES, Quebec. [They are the larvæ of *Photuris pensylvanica*, De Geer. See CAN. ENT. vol. I. p. 39. We were fortunate enough to find a specimen of this larva on the evening of October 2nd, 1869, on the sandy road near the Port Credit Railway Station. It was a warm damp night with occasional showers.—ED.]

INSECTS AT THE PROVINCIAL EXHIBITION.—We are glad to see that our London friends obtained four prizes at the recent Provincial Exhibition held in their city, viz. :—

W. Saunders, 1st Prize for native collection.....	\$12 00
Do. Extra Prize for foreign “	4 00
E. B. Reed, 2nd Prize for native “	8 00
London Branch of Ent. Soc. Can., Extra Prize for English insects	6 00
	<hr/>
	\$30 00

We understand that the Londoners make a rule of giving the amount of their prizes to the funds of their Branch of the Society; this is a most laudable practice, and we heartily recommend its adoption in other localities, as the Society stands in need of all the money it can get. The following account of this department of the Exhibition we clip from the *Toronto Globe* :—

“In few departments of the Exhibition was there a more noticeable improvement than in that of Natural History, especially in the show of insects, which, this year, embraced the finest collection of butterflies, moths, and beetles ever brought together in the Dominion of Canada. This improvement was entirely due to the exertions of the resident members of the London Branch of the Entomological Society of Canada, who, at the cost of considerable time and labour,

had prepared their private collections for exhibition to the public. The whole number consisted of sixty-three cases, embracing probably two thousand different species, and five or six thousand specimens. They were all neatly arranged in their proper scientific order, and were also labelled in a general way with reference to their beneficial or noxious qualities. The principal collection is the property of Mr. William Saunders, of London, a gentleman who has attained a high reputation among scientific men as a thorough entomologist. It includes twenty-two cases of Canadian insects, and four of foreign species. It is undoubtedly the best private collection in the Dominion, and would be worthy of consideration anywhere. Next to this was a collection of English butterflies and moths, the property of the Entomological Society. The case of butterflies included a representative of every British species. The moths were not so complete. These are interesting as objects of comparison with the allied species of this country. Mr. Edmund Baynes Reed, the Local Secretary of the Society, exhibited his private collection of sixteen cases of beetles, butterflies, moths, dragon-flies, &c. Among these are some magnificent specimens. We especially noticed a case of Underwing moths (*Catocalidæ*), which includes some very beautiful species. The Rev. G. M. Innes, of London, showed seven cases of Canadian butterflies and moths, and an interesting case of specimens of various orders from Labrador, a portion of our country whose natural history has not yet been much investigated. Mr. J. M. Denton, also of London, exhibited nine cases of native insects, some of English butterflies, all in very nice order, and including many fine specimens."

MOUNTING SMALL INSECTS.—I have adopted successfully the following plan of preparing and mounting very small insects for the microscope, such as parasites and acari from birds, beetles, &c. Having procured the parasite alive, I place it on the inside of a sheet of tolerably good note paper, folded, and when in the act of running, I close the paper and press it tightly in a book, which, for want of a better press, I put between two books in my bookcase. By this means I find the legs, antennæ, &c, nicely extended, all the expressed moisture absorbed by the paper, and the skin apparently unbroken. I allow it to remain in the book about two days, when it is carefully removed from the paper, put into the turpentine bath, and afterwards mounted in balsam in the usual way.—A. A., F. in *Science Gossip*.



EXCHANGES.

GALLS AND GALL-INSECTS.—Galls and Gall-Insects from all parts of the globe are my speciality, and since the lamented death of my friend Mr. Wilson Armistead, of Leeds, († February 18th, 1868,) I am carrying on the researches which he so vigorously started in this field. I shall therefore be happy to enter into correspondence and exchange, or contributions of specimens, with any gentleman in Canada who takes an interest in this particular branch of Entomology.—ALBERT

MULLER (of Basle, Switzerland, but residing now in England), Eaton Cottage, South Norwood, London, S. E., England.

LEPIDOPTERA.—I wish to obtain any North American specimens of *Phalanites*, Latr., especially such forms as are not likely to be found in southern New Hampshire or Eastern Mass.; any species of *Urapteryx*, *Acidalia*, *Coremia*, *Cidaria*, and *Boarmia*, will be particularly acceptable. New Canadian species I will describe in the CAN. ENT. I have some 70 specimens of *Hesperia metacomet*, Harris, about equal numbers of both sexes, for exchange.—C. S. MINOT, 39 Court Street, Boston, Mass.

COLEOPTERA.—Species desired from Canada, especially the eastern region; can give in exchange Southern and Californian forms, as well as those from the New England States.—P. S. SPRAGUE, 227 Broadway, South Boston, Mass.

PHOTOGRAPHS.—An esteemed correspondent writes to us asking, "Is it possible to get up a 'Naturalists Photo. Exchange Club,' as I am anxious to fill an album with the portraits of my fellow labourers in the field of science?" Should such a thing be practicable, we should be very happy to render any assistance in our power; perhaps some of our correspondents will give us their opinion on the subject. Personally, we should be delighted to fill our album with the *cartes* of all our 'bug-hunting' friends, and should willingly send a copy of our own in return to any who cared to have it.—ED. C. E.

TEXAN INSECTS.—25,000 specimens of insects from Texas, for sale and exchange. G. W. BELFRAGE, Waco, McLennan Co., Texas. Care of Forsgard & Co.

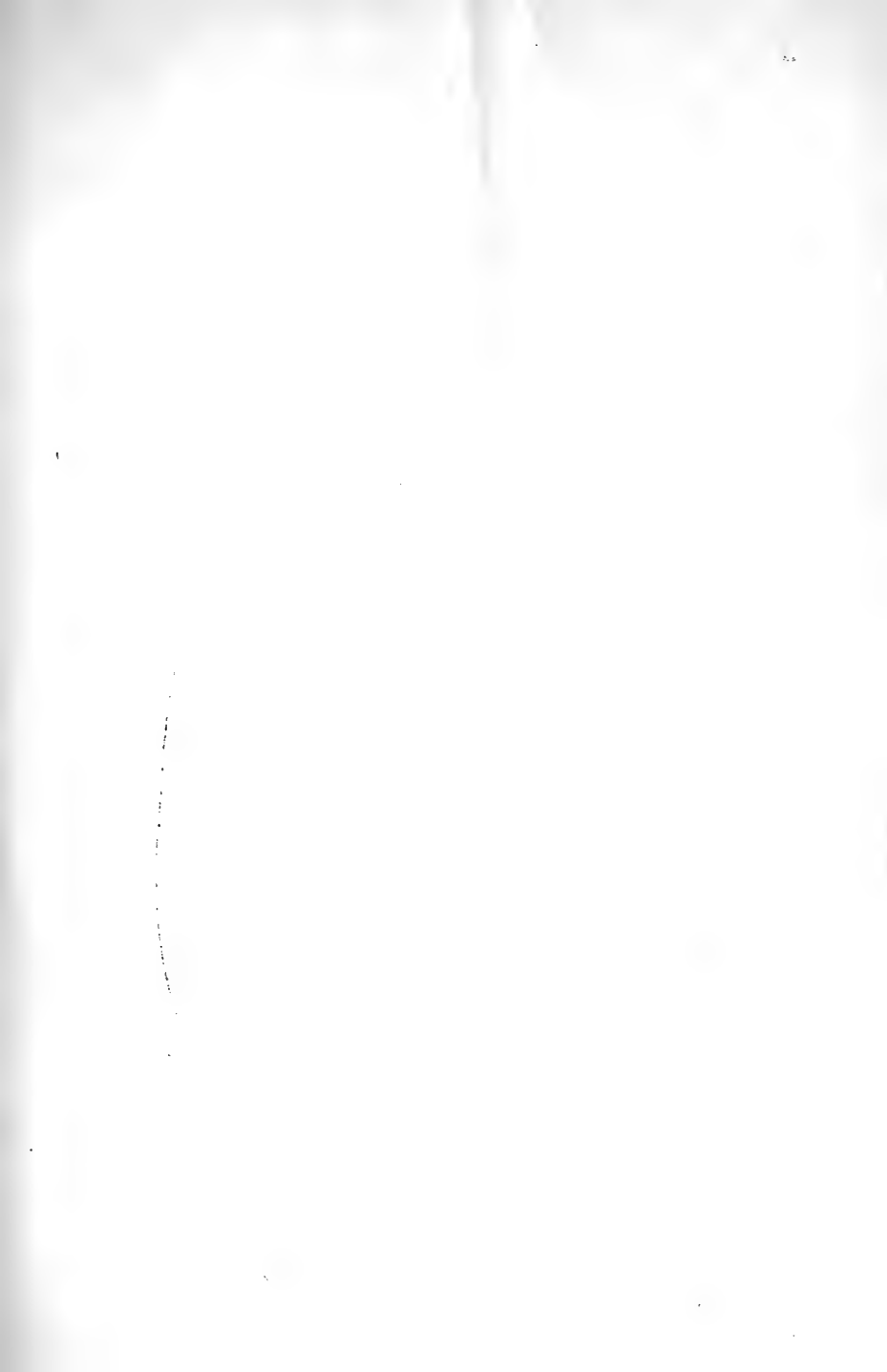
LEPIDOPTERA.—I wish to exchange eggs of *B. Yama-mai*, *Pernyi*, and *Cynthia*, for good specimens of *Arctia parthenos*, *A. Americana*, *D. versicolor*, *Thecla Ontario*, *Augustus*, *strigosa*, or almost any exclusively northern species. Correspondence requested.—W. V. ANDREWS, 130 Charlton Street, New York.

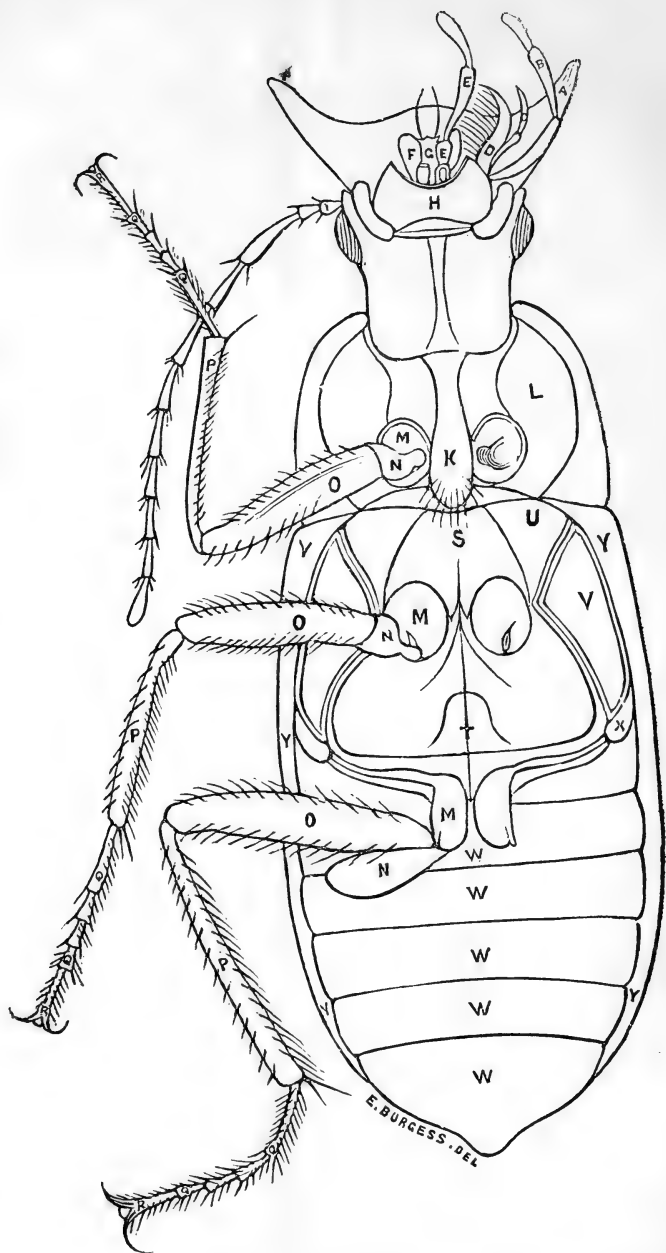
TO CORRESPONDENTS.

SUBSCRIPTIONS RECEIVED.—To vols. I. and II.: From A. M., London, England; J. W. H. R., Yarmouth, N. S. To vol. II.: From H. L. M., Malden, Mass.; C. S. M., Boston, Mass.; T. L. M., N. Y.; E. P. A., Cambridge, Mass.; F. P. A., do. (per *Am. Ent.*); W. H. E., Coalburgh, Va. Subscription to Packard's *Guide* from B. B., Ottawa.

C. H. B., Rock Island, Ill.—Your first letter enclosing 50 cents, has never reached us. Our rate of subscription is now \$1.25 per vol. Money must be at the sender's risk, unless in a registered letter, P. O. order, or Bank draft. The postage to Canada from the U. S. is 6 cents; when only 3 are put on a letter we have to pay 10.

N. H. C., Stratford, Ontario.—Please send a specimen of the *Dacne* that we may be able to determine the species. The pale colour is probably owing to immaturity.





HARPALUS CALIGINOSUS, Say. ♀.

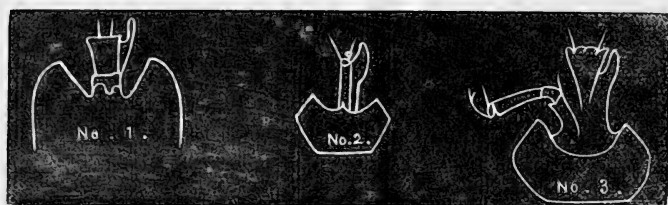


Fig. No. 1 shows the *Mentum* with emarginate tooth, *Ligula* and *Paraglossa* of *Pterostichus lucubundus*, Say.

Fig. No. 2. The toothed *Mentum*, narrow *Ligula* and broad *Paraglossa* of *Bradycellus rupestris*, Say.

Fig. 3. *Anisodactylus harrisii*, Lec., *Mentum* not toothed, apical dilatation of *Ligula*, and basal joints of *Labial palpus*.

PARTS OF CUT.

Ventral surface of *Harpalus caliginosus*.

A Mandible.	K Prosternum.	S Mesosternum.
B Maxillary palpus.	L Episternum of prothorax.	T Metasternum.
C Outer lobe of maxilla.	M Coxæ.	U Episternum of mesothorax.
D Inner lobe of maxilla.	N Trochanter.	V Episternum of metathorax.
E Labial palpus.	O Femora.	W Ventral segments.
F Paraglossæ.	P Tibiæ.	X Epimeron of metathorax.
G Ligula.	Q Tarsi.	Y Epipleura. [rax.
H Mentum.	R Ungues.	
I Antenna.		

EXPLANATION OF TERMS.

Base—That point of any organ nearest the centre of the insect.

Apex—That point of any organ farthest from the centre of the insect.

Dorsal—Upper surface.

Ventral—Under surface.

Emarginate—Sharp indentation.

Sinuate—Curved indentation.

Lateral—Pertaining to the sides.

Marginate—With the edge surrounded by a border.

Truncate—Squarely cut.

Transverse—Crosswise.

Obtuse—Rounded, not acute.

Acute—Pointed.

Thorax—Usually the dorsal surface between the head and elytra.

Prothorax—Usually the ventral surface to which the anterior legs are attached.

Mesothorax—That part to which the middle legs are attached.

Metathorax—That part to which the posterior legs are attached.

Elytra—The wing covers.

Elytral striæ—Longitudinal grooves in wing covers.

Elytral interstices—Spaces between the striæ.

Elytral dorsal punctures—Small impressions usually between the first and third striæ.

Scutel—Triangular piece at the base of the suture of wing covers.

Scutellar striæ—Abbreviated striæ each side of the scutel.

Suture—The longitudinal line of juncture between the wing covers.

Sutural stria—The groove next to the suture.

Rugose—Wrinkled.

Sulcate—Broad shallow groove.

Fovea—Large impression.

Connate—Joined together.

Reticulate—Covered with lines intersecting each other like a net.

The Canadian Entomologist.

VOL. II.

TORONTO, JANUARY 1, 1870.

No. 4.

THE ENTOMOLOGICAL SOCIETY OF CANADA.

To-day our Society enters with the New Year upon a new phase of existence. Hitherto it has been entirely dependant upon the unaided contributions and voluntary assistance of its members, who, in the very nature of things, are comparatively few in number, and scattered over a wide area of country; now it has received official recognition, and is furnished with such pecuniary aid as will enable it to carry out more effectually the work that it was intended to perform. We trust, then, that all our members will now bestir themselves, and work zealously and actively for the cause of Entomology in this country, and will show by their labours that the encouragement afforded them has been usefully and worthily bestowed. We have now made our first moult, but still continue in a larval state, with all a caterpillar's voracity for food; unless we get plenty we shall shrivel up and die. The sustenance that we require is more members, more work, more books, more specimens, more scientific contributions, more subscribers to our journal, more active co-operation on the part of all!

The following resolution unanimously adopted at the last meeting of the Council of the Agricultural and Arts Association of Ontario, describes our new position:—

“Resolved.—That the sum of four hundred dollars be appropriated in aid of the Entomological Society for the ensuing year, on the condition that the Society furnish an Annual Report, and form a Cabinet of Insects, useful or prejudicial to Agriculture and Horticulture, to be placed at the disposal of this Council, and that they also continue to publish their Journal.”

This assistance is very timely and acceptable, but it will be observed that it imposes upon us fresh work which will require the active assistance of our members to perform satisfactorily. The Annual Report is intended to be of a practical character and to resemble those issued by the State Entomologists in the United States; notes and observations in economic Entomology from all parts of the country will be especially needed for this. The cabinet of noxious and beneficial insects will also stand in need of contributions from all our mem-

bers everywhere, and will require an entirely distinct arrangement and system from that adopted in the Society's classified collections. Our readers will perceive that this is work for all to do; the humblest beginner, the merest collector, can render valuable assistance in his own way, as well as the more-advanced student of the science. Hearty co-operation, regular systematic observation and work are what we require, and what all can render if they choose.

Since our last issue, two regular meetings of the Society have been held in Toronto. At the first, Nov. 10, 1869, in addition to the ordinary routine business, letters were read from Baron Osten Sacken, and Dr. Hagen, acknowledging their election as Honorary Members of the Society, and from Mr. Sanborn and Mr. D'Urban as Corresponding Members; the thanks of the Society were voted to the Boston Society of Natural History, for the donation to the Library of a copy of the "Harris Correspondence;" and a number of specimens of *Buprestidæ* were exhibited by Messrs. Saunders, Reed, and Bethune. At the second meeting, Dec. 14, 1869, the resolution quoted above was read, and the meeting resolved upon accepting the grant of the Agricultural and Arts Association upon the conditions specified. Mr. F. B. Robertson was elected an Ordinary Member; the Secretary announced the much lamented death of Mr. B. D. Walsh, State Entomologist of Illinois, and obituary resolutions of a similar character to those passed at a meeting of the London branch, were adopted.

DEATH OF THE STATE ENTOMOLOGIST OF ILLINOIS.

It is with feelings of very great grief that we record the death of our much esteemed correspondent, Benjamin D. Walsh, M.A., State Entomologist of Illinois. He was walking, it appears, on the railroad track near the depot, at Rock Island, on Friday, Nov. 12th, when a train coming on him unawares, the engine caught his foot and crushed it. The injured limb was amputated, and for several days no great alarm was felt respecting his condition; it soon however, became evident that he had received serious internal injuries, and that there was no hope of his recovery. He lived till the 18th of the month, and then, after much suffering, breathed his last.

No words of ours are needed to tell the reader of the loss science has sustained by this sad accident. One of the most thorough entomologists in America has been taken from us in the full maturity of his powers; the accumulated stores of knowledge gathered during many years of zealous labors in the field, and in the study, have been closed to us for ever. Deeply do we deplore the bereavement, but humbly must we bow in meek submission to the incomprehensible wisdom of an overruling Providence.

The following resolutions respecting this sad event were adopted at a recent meeting of the London Branch of the Entomological Society of Canada:—

"*Resolved*.—That the members of this Society have learned with deep regret of the sudden death of Benjamin D. Walsh, State Entomologist of Illinois. We have long admired his zeal and earnestness in endeavouring to advance entomological science, and we feel that our favourite study has lost in him one of its staunchest supporters and advocates, and those of us who had the privilege of his personal acquaintance, a warm friend. We tender our heartfelt sympathy to his bereaved widow and friends, and assure them that his labour of love manifest in his many valuable contributions to entomological literature will ever be fondly cherished in our memories."

"*Resolved*.—That the Secretary be instructed to transmit copies of the above resolution to the widow of the late B. D. Walsh, and also to the editors of the *American Entomologist*, and *Canadian Entomologist*, requesting them to insert the same in their next issues."

A SINGULAR CASE.

Seeing in the last number of the *Canadian Entomologist*, a description of the eggs of *A. Luna*, reminds me to ask of you the explanation of a curious circumstance in the life-history of one bred by me from the larva last year. I will premise that I am writing without my notes, and therefore cannot give *figures* accurately, but can give the facts. There may be nothing very strange about it, but two of the best entomologists in the United States inform me that it is entirely new to them. It is this:—Some time in the latter part of the summer of 1868 I took, feeding on walnut leaves, a mature larva of *A. Luna*, from which I did not hope to rear the mature insect, because I counted on the larva over twenty eggs like those of a *Tachina*. Underneath some of these eggs I could discern with a lens a minute opening through which the fly-larva had entered the body of the *Luna* larva. The skin of the latter was more or less discoloured under each egg, but under some—under many in fact—there was a dense black spot, sometimes two lines in diameter. I made a slight incision in the skin of the *Luna* larva at the place where a *Tachina* larva seemed to have entered by one of the little holes, to see if I could find the *Tachina* larva. It was a very slight incision, as I did not wish to kill the *Luna* larva, but wanted to rear the flies from it to see if they were the same as those bred from *Saturnia Io*. Before it spun up it changed colour, becoming almost pink. It spun up, and to my surprise, instead of producing *Tachina*, there last spring emerged from it an unusually large *Luna*. The question which puzzles me is, what became of the parasites? According to all the books, I believe, the entrance of the parasite into the body of its proper host is certain death. Could it have been that the parent *Tachina* made a mistake, and that its progeny, not finding the *Luna* to their taste, died or made their escape? Even if they had died inside the *Luna* larva, must they not have occasioned its death, especially considering the number of them?

I will add that there was no possibility of a mistake, as I had but one other Luna larva, (and it had spun up before I found the infested one, and like it produced a perfect moth, though not so large as that from the infested one), and these were the only two Luna larvæ and the only two Luna moths that I ever saw. I still have both. The infested larva was the last to spin up, but the first to emerge. Can you tell me what became of the Tachinæ?

V. T. CHAMBERS, *Covington, Ky.*

P. S — Since the above was written, I have referred to my journal, and find that the first larva was taken on Sept. 2; the infested one on Sept. 4. The latter came out on May 6th, and the former on May 15th. Otherwise the facts are as above stated.—V. T. C.

NOTES ON SOME OF THE COMMON SPECIES OF CARABIDÆ, FOUND IN TEMPERATE NORTH AMERICA.

BY PHILIP S. SPRAGUE, BOSTON, MASS.

The many difficulties encountered by those entomologists who have neither time nor access to scientific libraries, but who wish to be more than mere collectors, have induced me to try and assist them, more especially those who are to some extent advanced enough to distinguish many of the families and genera of the Coleoptera. I also hope to be of some assistance to those beginners who have a true love of nature and her works. Yet were I to write for this class only, the *Entomologist* would be more than full for years. My first attempt will be to help the reader to classify some of the more common genera of *Carabidæ*, after which I will refer to the species, pointing out their particular differences by comparative descriptions. I shall endeavor to express myself in familiar phraseology, rather than in technical. To those who have not these instruments, a convenient magnifying glass, Le Conte's 'Classification and List of Coleoptera of N. A.,' are absolutely necessary. (1). I have had prepared a highly magnified drawing of one of our common summer beetles, *Harpalus caliginosus*, to plainly represent all those parts which are of the most importance in classification, the names should be printed with a pen on their appropriate parts, very plainly that you may know them at a glance. You will find it of the greatest advantage to dissect a number of beetles, of the same and allied genera comparing the different parts with each other and with the cut, and making drawings of the same, thus familiarising yourself with the form and parts pertaining to the subject; if you are a new beginner, or have never done this, it is absolutely necessary, and you will be surprised to find how much you have learned with so little trouble (2).

The cut only represents the ventral or under surface. When viewed from above you will find at the extreme anterior part of the head, between the

mandibles and covering the mouth, the *Labrum*; a little behind this, at the sides just forward of the eyes, are inserted the *antennæ*. The head fits into the *thorax*, which extends to the *elytra*, or wing covers, which are sometimes entire (*Cychnus viduus*) sometimes the true wings beneath are entirely wanting (*Pterostichus permundus*). The small triangular piece at the centre and base of the *thorax* and *elytra* is the *scutel*, the characters of which are not used in the classification of this family. The sexual characteristics are of particular importance, and may usually be known by the greater dilatation of the anterior tarsi of the male. In many genera it is absolutely necessary to have the ♂ to be positive; an instance in point is recorded, Proc. Acad. Nat. Sci. Phil., page 382, Dec., 1868 (3). By reference to Le Conte's Classification you will find the family Carabidæ divided into sub-families, the last of which, *Harpalidæ*, the only one we shall now consider, contains the greater number of the species of *Carabidæ*. This sub-family is divided into tribes, these again into groups, two only of which, *Eurytrichi* and *Harpali*, containing most of the common summer beetles, will be now considered. In these forms we have the following plan of arrangement:—*Ligula* free at the apex, *Paraglossæ* distinct, *Elytra* rounded and sinuate at the tip, anterior and middle tarsi of the ♂ usually broadly dilated,—*Harpalini*, tribe.

Anterior and middle tarsi of the ♂ usually broadly dilated and covered beneath with a dense brush of hairs,—*Eurytrichi*. Group. Anterior and middle tarsi of the ♂ usually strongly dilated, and covered beneath with two rows (one on each side) of bristles,—*Harpali*. Group. As I presupposed in the beginning that you were somewhat acquainted with the different forms of the Genera, you will not confound these with *Pterostichus*, which has in the ♂ only three joints of the anterior tarsi dilated, or with *Chlanis*, which has bright metallic species, usually pubescent, or with *Oodes*, which very much resembles *Harpalus* in form, but differs by having the eighth and ninth elytral striæ confluent and the ocellate punctures very near the margin; this genus is scarce, and not easily distinguished from a number of others, except by those who have had much experience. We will now take into consideration part of the genera embraced in these Groups, remembering, that where they run into one another you will often be puzzled, and must refer to the classification, where the whole subject is carefully elaborated. The Group *Harpali* contains a number of genera, one of which *Gynandropus*, with but a single species common at the north, is .25 long, quite slender, shining black, thorax much narrower than the elytra, rounded before and behind, and decidedly convex; it resembles both *Pterostichus* and *Stenolophus*, but differs from all other species by the characters of the Group, and by having three rows of punctures on each elytron on the second, fifth and

seventh stræ, and by the anterior tarsi having the last joint elongated and dilated in the ♀. This last character is of much importance, as we have a division of *Harpalus* having the elytra punctured in three rows; to you who have this insect named in your collection, the above will enable you to verify it; to others it is of little importance, as it is one of the more difficult forms to determine. *Bradycellus* has the mentum strongly toothed, but with the exception of the two first species in the list, they are quite small, less than .25 long. The species of *Stenolophus* are also small and slender beetles, with the thorax rounded before and behind, which distinguishes them from *Harpalus*. With a common glass you will make but little progress with the two last named genera, for although they are both quite common, their small size and the excellent paper on *Agonoderus*, *Stenolophus*, and *Bradycellus* (which is as perfect as the long experience of our greatest American Entomologist can make it), renders it undesirable to treat of them in this paper. There is a division of the Genus *Harpalus* (*Selenophorus*) which, as Dr. Le Conte says, should be a separate genus, and which has the paraglossa flat, longer than the ligula, without lateral bristles, and the ligula is narrow, not dilated at the tip. Nearly all of this division are small and oval, having the form of the smaller common *Amaræ*, but have three rows of punctures on each elytron, only two species are commonly found at the north, *H. guginus* and *H. iripennis*, which resemble in general form the true *Harpalus*, having the paraglossæ rather thick, not longer than the ligula, and furnished at the sides with a few bristles, the ligula is truncate, they are mostly of medium or large size, and are found in the middle of summer; the mentum tooth is usually wanting, or quite small, except in three or four species, which are quite rare and inhabit the extreme west. The thorax is sub-quadrate (nearly square) the proportions of this part of the insect are quite deceptive, it appearing much longer than it really is, therefore you should measure it accurately until your eyes are familiar with this seeming difference. These beetles are rather broad and oval, varying from brown to black, two or three of the species are metallic green, more or less shining. The anterior and middle tarsi of the ♂ are dilated, covered beneath with two rows of squamiform papillæ. The posterior tarsi of the ♂ are like all of those of the ♀. Some have the elytra reticulate in both sexes, others in the ♀ only. The apex of the elytra of the ♀ in some species is prolonged into a short spine called the sutural spine, as it is a prolongation of the suture.

In my next paper I shall commence the description of the species, having given you here an outline of the genera.

1. The Watchmakers common jewellery glass, having two lenses of about a half-inch focus, will answer for all but the most minute forms. It costs

less than One dollar, U. S. The Smithsonian Classification of the Coleoptera of N. A., by John L. Le Conte, M.D., 1861-1862, and the List of Coleoptera of N. A., 1863-1865, are indispensable; be particular to get the latest edition, these pamphlets can be had at the Naturalists' Book Agency, Salem, Mass.

2. A cheap and convenient dissecting board, which will answer all requirements, can be made by taking a smooth piece of board, one inch thick 8×12 inch, glueing to the middle a piece of soft wood or cork, about two inches square, one-half thick: put up a standard three inches high on one side of the board near the middle: next twist a small piece of annealed wire around your eye-glass, leaving one end long enough to pass around or through the side of the standard, thus bringing your glass over the centre of the board, the wire can then be bent so as to have the focus come where you please. Cover the small centre piece with white paper, on this you can pin or glue the specimen as you please, and now, with your glass in position, you have both hands to work with. Take two or more pieces of wood like the small tip of a penholder, force a fine needle into the end of each, heat the points in a flame, and by quickly pressing them against a piece of iron or glass you have a set of dissecting hooks; with these you can hold the insect and separate the various parts.

3. Proc. Acad. Nat. Sci. Phil., page 382, Dec., 1868.—*Bradycellus* (*Geobænus*) *arenarius* Lec. "is proved by the discovery of the ♂ to belong to the genus *Amara*." Therefore, those having this beetle named *Bradycellus* must change the label to *Amara*.

4. This valuable paper, which is advertised under the title of "Species of *Baridius* of U. S., 1868," can be had at the Naturalists' Book Agency, Salem, Mass., Price 10 cts., postage U. S. 2 cents.

THE CURRANT WORM AGAIN.

BY W. SAUNDERS, LONDON, ONT.

In the last number of the *Entomologist* our late esteemed friend Mr. B. D. Walsh, whose sudden death we most deeply deplore, calls in question the correctness of my inference regarding the occasional hybernation of the currant worm, intimating that my conclusions were based upon insufficient data. He says, "I can see no reason why a larva might not have hatched out from the egg in London, C. W., in the first week in May 1869, spun up on Mr. Saunders' paper bag on May 30th, 1869, and the cocoon been noticed by that gentleman for the first time, as he informs us, May 30th, 1869. Yet Mr. S. from these data arrives at the conclusion that such a larva *must* have remained

unchanged during the winter and constructed its cocoon after the 22nd of May."

I am sure our much lamented friend must have overlooked one portion of the paragraph to which he refers, which was written with the express intention of removing such an objection as he urges, should it arise. I there stated that on the 22nd of May I was trying some experiments in crossing gooseberries—fertilizing the flowers of the Houghton seedling with pollen from some of the English varieties. Anyone who has thought for a moment on this subject will see that to ensure success in hybridization, it is necessary to open the flowers before they are ready to burst of themselves and remove the male organs before the pollen is fully matured, so as to prevent natural impregnation; and also to avoid another source of danger, that of the carrying of pollen by insects from other flowers and its deposition on the stigma of the flower on which you wish to operate. It is well known by those who have cultivated the gooseberry that the flowers are open before the leaves are fully expanded, and that the whole process, from the bursting of the buds to the opening of the flowers, is accomplished in a very short time—usually, I think, within five or six days. I believe that all entomologists agree that the eggs of the saw fly are *invariably* laid on the under side of the leaves, and usually attached to the larger veins. On the date before referred to, the 22nd of May, as the flowers were not then open, there would be scarcely a leaf on the bush sufficiently developed to serve the purpose of the female fly as a resting place for her eggs, and yet nine days after this the cocoon was found attached to the paper bag, and quite firm in its texture, as if it might have placed itself there several days before. From 10 to 14 days would probably elapse from the time of depositing the egg to the appearance of the young larva, and two weeks more, at least—perhaps three—would be required to bring it to its full growth. This work of a month or five weeks could not possibly have been crowded into the space of eight days or less, and I think I can scarcely be accused of rashness in forming the conclusion I did, that in this instance the larva *must* have remained unchanged during the winter, probably under the surface of the ground, then crawled up the bush, attaching itself to the paper bag, and there constructing its cocoon, some time between the 22nd and 30th of May.

The hemipterous insect Mr. Walsh refers to in the closing paragraph of his paper I have succeeded in rearing. It is not yet determined, but as far as I can learn is distinct from either of the species referred to by myself or Mr. Walsh; as soon as it is correctly determined I shall give its name publicity.

REMARKS ON THE HISTORY AND ARCHITECTURE OF THE
WOOD PAPER-MAKING WASPS.

BY WILLIAM COUPER, OTTAWA, ONT.

The history of the wasps of temperate America has not been recorded. It appears that entomologists have no great desire to study those interesting insects; and although several species occur in Canada, we know little or nothing of their natural history. One species, the spotted wood wasp (*Vespa maculata*, Linn.), occurs commonly, as near as I can determine, about every third year, in our northern woods. Having partially studied its habits, and collected a series of the nests in all their stages, it is particularly in regard to the latter that I claim attention. But before I proceed to relate what I have ascertained regarding their architecture, it will suffice to state that each large nest which we notice suspended from trees towards the end of summer consisted of a colony of males, females and workers or imperfect females, as they are termed. The large nest is certainly the second, probably the third structure which has been formed by an industrious colony of workers during the warm months of summer. In this latitude, late in the fall and early in spring, we find large and small females in a torpid state. They are the generators of the forthcoming colonies, and the only living remnant of the large number of distinct individuals which inhabited one of the deserted nests of the previous season. These females leave the nest on the approach of cold weather in October, or according to the latitude where they occur, and they then carry impregnated ovaries from which are produced eggs to constitute a young colony of from eight to twelve workers in the following spring. The gradual warmth, generally in the early part of May, awakens the torpid female, and she emerges from her winter's abode to perpetuate her species. After partaking of such food as can be procured at this season, she is now prepared to fulfil another part of her mission—instinct teaches her that she must be her own builder—and for this purpose she goes forth to select a suitable sheltered situation. When this is found, she collects and prepares woody fibre from weatherworn fences, &c, by which, in the course of a week or ten days, she forms a little pretty spherical paper nest. After it is perfected, she attaches a single tier of hexagonal cells, in each of which an egg is deposited. The first egg is placed in the central cell, and as far as I have been able to watch the parent, and from examination of several of these small nests, I am of the opinion that she does not deposit all her eggs simultaneously, but that there is a lapse of time between the deposition of each egg. I am led to this conclusion, because in several nests which I have examined, larvæ occupied the central cells, while some of the surrounding ones contained eggs; besides, I have ascertained that the young workers issue from their cells at stated periods, one after another. Here, then, we

see a beautiful provision Providence has made for the perpetuity of what we look upon as an insignificant wasp. It has been provided with instinct to guide her; indeed, it appears to me that she has a kind of understanding that her progeny are to be brought forth gradually, therefore she only deposits a single egg at a time, when a lapse of a day or more occurs between each, which is no doubt caused in order that her labor in the collecting of food (for they are ravenous eaters in their larval state) may be brought about with greater facility, or, correctly speaking, that the time for procuring food and watching the nest will be equally divided. She is therefore only compelled to feed two at a time; and by the period of the issue of larvæ from advanced eggs, the first two have ceased to feed and are no more trouble to her, as they are prepared to spin cocoons to enclose themselves in their cells to undergo the third stage of their life. The parent wasp has also the accuracy and knowledge of a bird in regard to the locality of its nest: indeed, the attachment is as great, and which is not abandoned until it is deserted by her progeny to construct the second. I have had the pleasure of watching the formation of the parent nests of *Vespa maculata* and *germanica* from the time they were commenced until completion, and I now record a difference in their mode of working from the European *V. vulgaris* or its American representative, *i. e.*, that the pedicel and the tier of cells are the last portions of the work finished. In some rare examples, the inner dome and part of the second exterior envelope are not fully completed when the pedicel and tier of cells is attached to the roof; but there may be a force of nature in these deviations from the general plan of architecture, which I am not prepared to solve. Kirby says: "That the common wasp of Europe (*Vespa vulgaris*, Linn.) only partially completes the dome before the uppermost tier of cells are begun, and when the first tier is finished, the continuation of the roof or walls of the building is brought down lower; a new tier of cells is erected, and this work successively proceeds until the whole is finished."—*Introduction to Entomology*, Vol. I., p. 504-5. The first and second nests of *V. maculata* and *germanica*, with the exception of the rare specimens before mentioned, are not formed in this manner, for all those which I have examined had their exterior covering and the aperture fully formed before the first or second tiers of cells were commenced. In order to confirm my former statement that the parent nest is abandoned by the first issue of wasps, and that it is not enlarged, as many people suppose, one of these little nests was found occupying the full extent of a cavity in an old tree stump. It contained a single tier of eighteen perfect cells, which I believe is the maximum number of the parent nest. They are found from one and a-half to three inches in diameter, and contain from one to four partitions or envelopes. These distinctions may be attributed to the bulk and strength of the parent

architect—for I find a great difference in the size of hiberna females—one found under bark of a tree at Quebec, on the 20th May, measured seven-eighths of an inch, and two others which I found under decayed leaves in the woods near Ottawa measured five-eighths of an inch in length. There is some motive for these varied proportions which as yet requires explanation. *Vespa maculata* invariably suspends its nest from the branches of beech and maple trees. These may be found common during some seasons between the months of July and October. The structural conformity of those of the second colony are remarkable from being only about half the size of the third—for there cannot be a doubt on my mind but that *Maculata* constructs a third—and that is the large nest we find in the fall of the year, and the one in which the males are produced. It is during the season that the second form of nest is inhabited that these insects should be watched, and I am sorry that I have not had that opportunity, as I should have determined the existence or not of males at this period.

The parent wasps are very fond of building their nests in the neighborhood of our dwellings. Sometimes they are found attached to sheltered situations in out-houses, and their object in selecting these situations is no doubt to be close to localities where they can procure food to rear their young quickly. The entomologist may look for these little nests early in May; thenceforward he can find them in all stages of progress, but few will be found containing eggs before the 25th of May, which is about the time that the first egg is deposited. Larvæ appear about the 7th of June. *Vespa maculata* was the species prevalent in the woods near this city in the summer of 1868. Last year *Vespa germanica* was predominant, and I append two or three notes regarding them.

May 30th—Found a nest of *V. germanica* under a piece of old bark, on the ground. Appearance of nest similar to that of *V. maculata*. There was only one egg in the central cell

June 7th—Found a second nest of *V. germanica*. It contained twelve cells, ten of which had eggs, and the two central contained larvæ, apparently hatched a few days previous. The eggs are attached to the inner wall at the bottom of each cell. This nest had three partitions of similar construction to that of *V. maculata*.

June 13th—Examined the nest found on the 30th ultimo. It appeared to have been increased by an additional envelope. In taking up the piece of bark and holding the aperture so that the rays of the sun could enter it, I detected larvæ in the central cells, but they were very small. When I first found this nest, the parent came out and flew about my head, but on this occasion I had to blow into the aperture ere she came out, and when she did

there was no fear exhibited, nor did she fly away, but stood on the outside of the wall while I examined the interior.

One part of the history of this species, I am sorry to say, I have not had an opportunity to investigate—that is, their economy while in the second nest, for I believe that it is during this stage of progress that a true account of the individuals which constitute the colony can be determined. Here we could, no doubt, arrive at some conclusion regarding the correct dates of the appearance of the sexes which are said to occur towards the autumn. Reaumer states that there are two sizes among the males. It would be interesting to know if they are permanent kinds. Kirby, and other writers on Insects (see Westwood's Int. to the Modern Class. of Insects), states that the neuters, or what are now termed undeveloped females, "massacre the later brood of larvæ which are not able to undergo their transformation before the setting in of the winter." This may, no doubt, be the end of the later larvæ of the two species here spoken of, but it is not the case with the pupæ which occupy the cells of *V. maculata* in the autumn, as I procured living specimens from nests brought home in October. The second nest of *V. germanica* contains two tiers of cells, which are generally enveloped with six or more partitions. During the warm season in which it is occupied, proper ventilation is necessary to insure the health and increase of the colony; therefore the wasps never neglect this important mode by which the interior is kept at an equal temperature. The innermost partition encircles the double tier of cells, but its aperture is larger than the next outermost, and the aperture of each decreases towards the exterior one until it is only of sufficient size to admit one or two insects. In order that pure air be properly obtained, and that the circulation should be sufficient to force foul air from the interior, we find other apertures on the exterior partition, which lead in zig-zag passages from one partition to another until they reach the interior. This mode of ventilation is beautifully illustrated in the large autumnal nests, and for a good reason, we generally find them containing from four to five tiers of cells and a numerous colony, which obtains its full strength in this nest. In a nest lately examined the latter number of tiers was found; the two uppermost consisted of small cells, and those of the two central were of larger dimension, and had been evidently occupied by males and females, while the fifth or lowermost tier does not appear to have been occupied; but it is nevertheless curious *that it agrees in size, number and form of cells to that found in the parent nest in spring.*

Notwithstanding the powerful sting with which some of them are provided, wasps are liable to the attacks of other insects, and their nests are entered by parasites belonging to the orders of Coleoptera, Hymenoptera and Diptera, for the purpose of depositing their eggs in the cells containing the larvæ.

Nests of the second and third colonies which I took from branches about fourteen feet from the ground, at the end of October, 1868, are infested with a Hymenopterous parasite. One of these species issued from a cell of *maculata* about six days after it was in my possession. Five came from one cell. I sent this Hymenopter to Mr. Cresson, of Philadelphia, and he has since described it as a new species, *Euceros burrus* (*Canadian Entomologist*, i. p. 104). This parasite occupied a longitudinal position in the cell of the wasp, and its cocoons were slightly made, and stood side by side. I also remarked that they issued from a cell which was covered with the cap which is generally spun by the wasp larva prior to its changing into a pupa. Therefore I think that *E. burrus* is a wasp pupa parasite. There are at present cocoons of what I take to be another species occupying about two-thirds of the cells of a nest of *Vespa maculata*, but differently shaped from the cocoons of *E. burrus*, being generally triangular in shape externally, but having an interior cocoon occupied at present with the larva. The curious shaped cocoons, of chestnut color, are all situated at the bottom of the cells, and only in those cells which are open, but having the larval lining to the walls of the cells, and in every instance uncovered. For this reason I believe that this parasitic larva, which has now lain in cocoon since October, 1868, and is not yet developed into the perfect insect, is probably a wasp larvæ parasite, and they illustrate what entomologists term "the metropolis of a species." When they issue, we may conclude it to be their prolific year.

LIST OF COLEOPTERA.

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from page 18.)

GYRINIDÆ.

GYRINUS, <i>Linn.</i>	* <i>Aeneolus</i> , <i>Lec.</i>	DINEUTES, <i>McLeay</i> .
* <i>Picipes</i> , <i>Aubé.</i>	<i>Fraternus</i> , <i>Couper.</i>	<i>Americanus</i> , <i>Linn.</i>
* <i>Ventralis</i> , <i>Kirby.</i>	* <i>Iugens</i> , <i>Zimm.</i>	* <i>Carolinus</i> , <i>Lec.</i>
* <i>Analís</i> , <i>Say.</i>	* <i>Limbatus</i> , <i>Say.</i> ¹	

HYDROPHILIDÆ.

HELOPHORUS, <i>Fab.</i>	HYDROCHUS, <i>Germ.</i>	HYDRÆNA, <i>Klug.</i>
<i>Lacustris</i> , <i>Lec.</i>	<i>Squamifer</i> , <i>Lec.</i>	* <i>Pensylvanica</i> , <i>Kies.</i>
<i>Lineatus</i> , <i>Say.</i>	* <i>Excavatus</i> , <i>Lec.</i>	HYDROPHILUS, <i>Geoff.</i>
<i>Scaber</i> , <i>Lec.</i>	* <i>Simplex</i> , <i>Lec.</i>	<i>Triangularis</i> , <i>Say.</i>

*Species marked with an asterisk have not before been included in the list of Canadian Coleoptera.

¹ From Canada East.

HYDROPHILUS, <i>Geoff, cont.</i>	HYDROBIUS, <i>Leach.</i>	Ochraceus, <i>Mels.</i>
<i>Lateralis, Hbst.</i>	* <i>Insculptus, Lec.</i>	Cinctus, <i>Say.</i>
* <i>Ovalis, Zieg.²</i>	* <i>Digestus, Lec.</i>	* <i>Bifidus, Lec.</i>
HYDROCHARIS, <i>Latr.</i>	* <i>Subcupreus, Say.</i>	CERCYON, <i>Leach.</i>
<i>Obtusatus, Say.</i>	PHILHYDRUS, <i>Sol.</i>	Flavipes, <i>Er.</i>
BEROSUS, <i>Leach.</i>	* <i>Fimbriatus, Mels.</i>	* <i>Prætextatum, Muls.</i>
<i>Striatus, Say.</i>	* <i>Maculicollis, (Muls).</i>	CRYPTOPLEURUM, <i>Muls.</i>
LACCOBIUS, <i>Er.</i>	* <i>Nebulosus, Say.</i>	Vagans, <i>Lec.</i>
<i>Agilis, Rand.</i>	Perplexus, <i>Lec.</i>	

SILPHIDÆ.

NECROPHORUS, <i>Fab.</i>	Surinamensis, <i>Fab.</i>	ANISOTOMA, <i>Ill.</i>
<i>Marginatus, Fab.</i>	Laponica, <i>Hbst.</i>	Obsoleta, <i>Lec.</i>
<i>Pustulatus, Herschel.</i>	Marginalis, <i>Fab.</i>	LIODES, <i>Latr.</i>
<i>Mortuorum, Fab.</i>	Inæqualis, <i>Fab.</i>	Globosa, <i>Lec.</i>
* <i>Pygmæus, Kirby.³</i>	Peltata, <i>Catesby.</i>	* <i>Polita, Lec.</i>
<i>Orbicollis, Say.</i>	NECROPHILUS, <i>Latr.</i>	* <i>Dichroa, Lec.</i>
<i>Sayi, Lap. (lunatus Lec.)</i>	* <i>Subterraneus, Fab.</i>	AGATHIDIUM, <i>Ill.</i>
<i>Velutinus, Fab.</i>	CATOPS, <i>Fab.</i>	* <i>Oniscoides, Beauv.</i>
<i>Obscurus, Kirby.</i>	Opacus, <i>Say.</i>	Exiguum, <i>Mels.</i>
SILPHA, <i>Linn.</i>	* <i>Terminans, Lec.</i>	Revolvens, <i>Lec.</i>
	* <i>Parasitus, Lec.</i>	

SCYDMENIDÆ.

SCYDMÆNUS, <i>Latr.</i>	* <i>Capillosulus, Lec.</i>	Rasus, <i>Lec.</i>
* <i>Fossiger, Lec.</i>	* <i>Basalis, Lec.</i>	

PSELAPHIDÆ—(BRENDÉL'S SYNOPSIS).

CTENISTES, <i>Reich.</i>	Rubicunda, <i>Aubé.</i>	EUPLECTUS, <i>Leach.</i>
* <i>Piceus, Lec.</i>	DECARTHON, <i>Brend.</i>	* <i>Confluens, Lec.</i>
BRYAXIS, <i>Leach.</i>	* <i>Abnorme, Lec.</i>	RHEXIUS, <i>Lec.</i>
* <i>Perforata, Brend.</i>	BATRISUS, <i>Aubé.</i>	* <i>Insculptus, Lec.</i>
* <i>Illinoisensis, Brend.</i>	* <i>Lineaticollis, Aubé.</i>	

(To be continued.)

MISCELLANEOUS NOTES.

PIERIS RAPÆ, Linn.—In your "Miscellaneous Notes," of Nov. 15, your correspondent, T. L. Mead of New York, speaks of having captured "a specimen of *P. rapæ* on flowers in a salt marsh on the New Jersey side of the

² A single specimen taken several years ago on the shore of the Lake, only lately identified.

³ Dr Le Conte, in his List, has placed *N. pygmæus*, Kirby, as a synonym of *N. mortuorum*, Fab., but, as Dr. Horn informs me, now considers them distinct. A fine specimen of the variety *crispetus*, Motsch, was taken here by Dr. Milward.

Hudson River." If he had 'hunted' the 'Hill' on which Hudson City stands, instead of the 'salt marsh' at its foot, he might have captured a hundred specimens instead of *one*. The increase of this insect during the last two years is marvellous.—W. V. ANDREWS, New York.

LIMENITIS PROSERPINA, Edw.—Mr. J. M. Jones sent us a coloured drawing of a specimen captured near Halifax, Nova Scotia, which we consider to be a specimen of *L. proserpina* Edw. We sent the drawing, however, to Mr. Edwards, the highest authority, who replied as follows:—"I think the figure is of *Proserpina*; the white band is rather unusually broad on the upper surface, but no two of the specimens I have seen are alike in this respect. If you examine a series of *Arthemis* you will notice a large range of variation in all respects, and probably *Proserpina* varies as much.—C. J. S. B.

BOOKS RECEIVED.

We regret that our limited space will not permit us to give more than a line of acknowledgment to the many books, papers, etc., that we have received since our last notice. Our regular exchanges will please accept our thanks for their favours during the past year, and our request for their continuance in the future.

Packard's *Guide to the Study of Insects*. Part X., October, 1869. This thick part, of nearly 150 pages, illustrated with three full-page plates and 80 wood-cuts, completes this valuable work, which ought to be in the library of every entomologist in America. The part before us contains an account of the Neuroptera, Arachnida and Myriapoda; an Entomological Calendar, Glossary, copious Index to the whole work, and the Author's Preface and acknowledgments.

Notice of the Crustacea collected by Prof. C. F. Hartt on the coast of Brazil in 1868, with a list of Brazilian Podophthalmia. By Sidney I. Smith.

Description of a new species of Grapta, and Notes on G. interrogationis. By J. A. Lintner.

A Descriptive Catalogue of Medical and Scientific Books. By J. Y. Green, Newport, Vt.

Le Naturaliste Canadien. Vol. ii., No. 1. Dec., 1869. Quebec. We rejoice to observe the tokens of prosperity manifested in the handsome wrapper and generally improved appearance of our French contemporary. We sincerely wish the editor and proprietor, M. l'abbé Provancher, unbounded success in his laudable undertaking.

Once a Month, Arthur's Home Magazine, and The Children's Hour. January, 1870. T. S. Arthur & Sons, 809 and 811 Chesnut Street, Philadelphia. Three well-known and highly popular illustrated magazines, decidedly American, of course, in their style and matter, but withal instructive and readable.

Hardwicke's Science-Gossip. Sept to Dec., 1859. London, Eng. Full of interesting matter.

Newman's Entomologist. Nos. 71 and 72. From Mr. Reeks.

The American Naturalist. Vol. iii., Nos. 8, 9 and 10. Salem, Mass.

The American Entomologist. Vol. ii., Nos. 1 and 2. St. Louis, Mo.

The American Agriculturist. New York.

The Canada Farmer. Toronto.

The Maine Farmer. Augusta, Me.

The (Weekly) N. Y. Sun. New York.

Proceedings of the Boston Soc. Nat. Hist. Vol. xiii., pages 1 to 160.

The Educator. London, Ont. Vol. ii., No. 12. An illustrated monthly.

TO CORRESPONDENTS.

W. V. A., New York.—Your subscription to vol. ii. was duly received and put to your credit; by an oversight it was omitted from the list of acknowledgments. You were quite right in sending \$1.25; \$1 is the price in *gold*, the basis of our Canadian currency.

BACK NUMBERS.—In answer to numerous enquiries we beg to state that we can supply a limited number of copies of our *first* volume, neatly bound in the wrapper, for one dollar each. We have also plenty of copies of all the numbers from the beginning except Nos. 1, 3 and 4 of vol. i.; we shall gladly pay ten cents a-piece for copies of any of these three numbers sent to us in good order.

S. H., Boston.—We have a few feet left of the extra-thick cork, at 24 cents per square foot, but none of the ordinary thickness. We shall get a fresh supply of the latter from England shortly.

PINS.—We have still on hand a quantity of Klaeger's entomological pins, Nos. 4, 5 and 6, price 50 cents (gold) per packet of 500. These are the coarser sizes; we have ordered a fresh supply of Nos. 1, 2 and 3.

SUBSCRIPTIONS.—Members of the Society are reminded that their subscriptions for the year 1870 (\$2) are now due.

DONATION.—Mr. J. Pettit, of Grimsby, in making a remittance, kindly presented the balance, \$2.25, to the publication fund.

* * In future we shall acknowledge subscriptions to the *Canadian Entomologist* by enclosing a receipt for the amount received in the subscriber's copy, as the law permits, instead of in our pages as heretofore.

We crave the indulgence of many of our correspondents for having permitted their letters to remain so long unanswered. Entomology is with us a labour of love; other, and more pressing and important duties frequently prevent our devoting to it as much time as we would.

CLUB RATES.—In addition to the club rates announced on the second page of the wrapper, we are enabled to offer the following:—

The *American Agriculturist* (\$1.50) and the *Canadian Entomologist* (\$1) for \$2.00.

Once a Month (\$2) and the *Canadian Entomologist* (\$1) for \$2.25.

Arthur's Home Magazine (\$2) and the *Canadian Entomologist* (\$1) for \$2.25.

The *Children's Hour* (\$1.25) and the *Canadian Entomologist* (\$1) for \$1.75.

The *Educator* (36 cents) and the *Canadian Entomologist* (\$1) for \$1.05.

The Canadian Entomologist.

VOL. II.

TORONTO, MARCH 1, 1870.

No. 5.

NOTES ON SOME OF THE COMMON SPECIES OF CARABIDÆ, FOUND IN TEMPERATE NORTH AMERICA.

BY PHILIP S. SPRAGUE, BOSTON, MASS.

ARTICLE NO. II.

In my previous article upon this subject, I treated upon the classification and the particular distinguishing characters of the genus *Harpalus*; in this I wish to call attention to their specific differences, by noting those variations of form or structure which are so constant as to cause us to consider them as denoting distinct species. The general form of the beetles of this genus is oblong-oval, rather broad, thorax quadrate and in length from .30-1 inch, black piceous, shining. Our northern exceptions to this color are *H. viridiaeneus*, Beauv., and *H. erraticus*, Say, the former being bright brassy green, the latter dark ferruginous or the colour of immaturity. The cut accompanying the previous article was of *Harpalus caliginosus*, Say., a beetle so well known that I shall describe it in detail, that you may better understand my ideas in describing others. I shall suppose that you have taken up this beetle without any previous knowledge of its name; you perceive it has the general form of the genus *Harpalus*. We now proceed to examine the anterior and middle tarsi, the four first joints of which are strongly dilated, consequently it is a male, beneath they have at the sides a few coarse short bristles (had they been covered with a dense brush of hair, we should have laid it aside as most likely belonging to the genus *Anisodactylus*), its length from the apex of labrum to the end of the elytra is .90 (.80-1.05 are the extremes of specimens in my collection), width .35. If we now had access to descriptions of the beetles of this genus, we should find only one of this length or near it, consequently without further trouble we should only have to see that it agreed with the specific description. This is the largest *Harpalus* we have, being one-half longer than any other, and if the generic characters are well worked up, it cannot be mistaken for any other. The head is black with a few scattered punctures, nearly obsolete, the frontal impressions between the antennæ are well marked, apex of labrum

slightly emarginate at centre; mouth, tarsi and antennæ reddish brown, the latter with the two basal joints smooth; thorax nearly twice as wide as the head and much wider than long, finely punctured, confluent at the base and near the apex, sparsely at the centre on top, the dorsal longitudinal line distinct, abbreviated in front, sides depressed and flattened, making a wide margin which is punctured, it is narrow at the apical angle and very broad at the base, there is a very narrow raised border at the edge, on each side between the middle and margin a little inward from the base is a broad shallow fovea (basal fovea), more roughly punctured than the other parts, the sides are narrowed and rather broadly rounded forward from a little behind the middle, and sinuated posteriorly, the basal angles are acute with the apex pointed and somewhat extended outwards; elytra broader than the thorax, oval, with its greatest width near the middle, the apex is obliquely and slightly sinuated, the striæ are deep, very finely and rather sparsely punctured, interstices convex, no dorsal puncture; beneath dark piceous, punctured at the sides, mentum not toothed, on the abdominal segments beneath, each side of the centre, are seen a row of punctures from which a long bristle projects (ambulatorial setæ). I wish to call your attention to this marking for we have those with another set of setæ nearer the sides of the abdomen and called accessory ambulatorial setæ. The great length and breadth of this beetle distinguish it from all others of the genus, and I know of no beetle that it can be taken for.

During the middle of summer, under stones and boards in sandy soil near running water, beetles are found quite commonly, having the appearance of being immature in color; this is *Harpalus erraticus*, Say. Long .60 (.50-.68). Testaceous beneath, darker above with the elytra piceous, more slender than the preceeding. Head smooth, frontal impressions shallow, antennæ concolorous, with the two basal joints smooth; thorax smooth, with the sides depressed, leaving a wide margin suddenly and broadly dilated behind, finely punctured, the basal foveæ are distinct and usually punctured, sides rounded forward of the middle and strongly narrowed behind but not rounded, basal angles obtuse, scarcely rounded at the extreme apex; elytra much wider than the base of thorax, sub-oval, deeply and obliquely sinuate at tip, in the ♀ the outer angle acute and dentiform, the extreme apex is sometimes sub-sinuate, leaving a sutural spine, the striæ are moderately deep and impunctured, it has no dorsal punctures; the abdomen beneath is finely punctured and pubescent at base. In most examples of this species a slight sinuation of the thorax is seen on each side, about one-third of its length from the base, in some the basal foveæ are scarcely punctured, making the whole thorax nearly smooth. I have in my collection one specimen which is wholly

dark piceous, almost black, with the exception of the outer joints of the antennæ, which are covered with fuscous hairs. This beetle differs from all other species of *Harpalus* (except *H. retractus*, Lec., from New Mexico, which I have never seen), by the deep and peculiar sinuation of the apex of elytra and also by its immature color.

Harpalus testaceus, Lec.—Iowa and Illinois—must be similar in color, but is much smaller, long. 41, and also differs by belonging to the subdivision having accessory ambulatorial setæ. I presume from the fact that I never have obtained this beetle in my many western exchanges, that it is quite rare.

Harpalus viridiaeneus, Beauv., length 40 (32.42). Beneath black, above bright metallic green, more or less bronzed, sometimes coppery, rarely black; epipleuræ, legs, mouth and antennæ reddish-brown; head smooth, nearly black and darker than the thorax, which is a little wider than long, sides narrowed behind but not depressed, showing only the narrow border which is distinct wholly around the thorax, its basal foveæ shallow, somewhat linear, and with the angles and base punctured, posterior angles obtuse and very slightly rounded at the extreme apex; elytra wider than the thorax, with the sides finely punctured and pubescent, striæ not deep, and in some specimens nearly obsolete punctures may be seen, interstices flat, the apex is obliquely and strongly sinuate, in the ♀ the outer angle acute, no dorsal puncture. The color of this beetle marks it well, and with the apical sinuation of the elytra quite distinguishes it from others of the genus.

Harpalus amputatus, Say. Dr. LeConte refers to a beetle somewhat resembling the above (Pro. Acad. Nat. Sci., Philadelphia, page 99, 1865), as coming from Kansas, New Mexico, Saskatchewan, Montreal, Canada, which I will describe, hoping that others may have been more fortunate than myself in procuring it from this section. The only specimens I have seen were from New Mexico, one of which by the kindness of Mr. G. D. Smith, of this city, I have in my collection. Dr. LeConte, says (loc. cit.) "above metallic blue or green, nearly black, with the apex of elytra truncate." Three of the four specimens I have examined are nearly black, with the faintest tint of dark blue, and only one was brassy green. The following is a description:—Length 38 (37-41). Above and below nearly black, shining, legs and antennæ piceous. Head smooth; the thorax at the sides broadly rounded before and behind, basal angles nearly obsolete, sides of thorax not depressed, basal foveæ shallow, with the outer angles somewhat flattened and punctured; elytra broader than thorax with the apex nearly squarely cut off, striæ well marked, the ♀ with sutural spine. The truncate elytra and round thorax sufficiently mark this species.

Harpalus laticeps, Lec. Length 55 (52-60). Black above and below,

shining, very broad and convex, legs and antennæ rufo-piceous. Head very broad, black, shining, smooth, the frontal impressions small, antennæ short, not reaching the base of thorax, dark testaceous; thorax one-half broader than long, sides distinctly depressed at and behind the middle, basal foveæ broad, not very deep, finely punctured, sides well rounded before, distinctly narrowed behind, basal angles obtuse and rounded at the extreme apex, the fine raised border is distinct at the side and base, the dorsal line distinct, abbreviated in front; elytra a little wider than the thorax, not deeply striate, impunctured, interstices flat, a dorsal puncture behind the middle near the second stria, N. H., Me., Vt. The large head and convex and obese form, well mark this beetle. In the ♀ the elytra are slightly opaque or silky (*sericeo-opaca*) and generally with a small sutural spine. In nearly all of my specimens the sides of the thorax for a short space behind the middle are very slightly sinuate, the terminal spur of the anterior tibiæ is quite long and broad.

Harpalus rufimanus, Lec., 40-48. Black, shining; tibiæ, tarsi and antennæ rufo-piceous. Head smooth, not as broad as in the preceding, antennæ quite short; thorax distinctly wider than head, one-half wider than long, sides slightly depressed behind, broadly rounded and distinctly narrowed posteriorly, basal foveæ deep, somewhat linear, finely and confluent punctured, basal angles obtuse, scarcely rounded and sparsely punctured; elytra wider than thorax, ♀ "*sericeo-opaca*," striæ deeper than in the preceding, impunctured, a small but distinct sutural spine in the ♀, behind the middle two dorsal punctures on the third interstices, near the second stria. The two punctures near together behind the middle on each elytron mark this beetle from all the other species, and perhaps I may say from all *Harpalidæ*. I cannot understand why this peculiarity has not been noted; Dr. LeConte neither mentions it in his description of the species (Am. Lyc. Nat. Hist. 4,402), or in his notes "On the species of *Harpalus* inhabiting America, north of Mexico" (Pro. Acad. Nat. Sci., Philadelphia, page 98, 1865). I have in my collection 3 ♂, 2 ♀ thus marked, one of which Dr. Horn, of Philadelphia, and Mr. Ulke, of D. C., identified as *H. rufimanus*, Lec. I have seen two specimens in another collection thus marked, and I have also seen in Dr. Harris' collection, a specimen sent him by Dr. LeConte, from Lake Superior, and by me sent back to Dr. LeConte last year, for the Boston Society Nat. Hist., to be identified; now with eight specimens before me, one from Lake Superior, the others from N. H. near the White Mountains, all that I have ever seen agreeing perfectly with all descriptions (save this peculiarity), and these particular specimens identified by Dr. LeConte, Dr. G. H. Horn and Mr. Henry Ulke, three of our greatest American Entomologists, I can see no reason for believing this an accidental marking.

Harpalus spadiceus, Dej. Length 33-38. Rufo-piceous, legs and antennæ ferruginous. Head smooth, rather large, mandibles long; thorax one-half wider than head, a little wider than long, sides broadly rounded, not at all depressed, strongly narrowed behind, basal angles obtuse, not rounded, basal foveæ narrow, shallow, more or less punctured, disk smooth, somewhat convex; elytra oval, widest a little behind the middle, striæ deep, impunctured, interstices convex with a dorsal puncture on the third near the second stria, behind the middle, elytra not opaque or reticulate in either sex. This beetle resembles *H. herbivagus* in color and size, but is more robust (convex), and in this respect more like *H. fallax*, Lec., and *H. Pleuriticus*, Kirby, but differs from both by the larger head and mandibles, and the strongly narrowed thorax posteriorly; it resembles in form of thorax, *H. viridiaeneus*, but is still more strongly narrowed behind. Not common in New England; two examples from Massachusetts.

The above descriptions comprise most of our species whose form is so well marked, as to be most readily recognized, and not easily confounded with others.

The reader is requested to make the following correction in my first paper:—Page 46, line 15 from top, after "*this paper*" insert "(4);" and at line 22, for "*having*" read "*the latter, however, has.*"

ON THE LARVA OF *THECLA INORATA*, G. & R.

BY W. SAUNDERS, LONDON, ONT.

On the 15th of June, 1869, I obtained several *Thecla* larvæ by beating over an umbrella the branches of some small oak trees growing in a cemetery about two miles west of London. Not having met with them before I at once took the following description:

Length, .40 in., onisciform. Head small, pale greenish-yellow, with a minute black dot on each side. Mandibles pale brown, with a faint whitish patch immediately above them.

Body above *yellowish-green, streaked above with yellowish-white*, and thickly covered with fine, short, white hairs; second segment of rather a darker shade of green than the rest of the body. *A dark green dorsal stripe, on 3rd, 4th and 5th segments, the full width of the dorsal crest; narrow on the four terminal segments, almost obsolete on those intermediate.* A faint whitish dorsal line runs through the centre of this stripe. Dorsal crest edged with yellowish-white, most apparent where it borders the darker portions of dorsal stripe; sides of body with a few faint oblique lines of yellowish-white; body margined on each side with the same color close to

under surface extending around the posterior segments. In some younger specimens these yellowish-white markings have a reddish or brownish tint.

Under surface deeper bluish-green, with a faint white bloom. Feet and prolegs partake of the general color.

June 21st.—Since the 15th most of the larvæ have moulted, resulting in some change in their appearance.

Length .55 in. Head, color and markings as before.

Body above dull white with a faint green tinge, changing in some specimens to a slight ochrey-reddish tinge, thickly covered with minute white hairs; second segment pale green. The green dorsal stripe on third, fourth, and fifth segments has acquired a deep greenish brown tint, which contrasts strongly with the general color of body; the same change is also observable on the last four segments, and here the stripe is much widened, the anterior portion of it assuming the form of a triangular patch, its base on posterior part of eleventh segment, its apex on anterior part of tenth; on the intermediate segments the dorsal stripe is obsolete. On the fifth segment a streak of dark brown crosses the end of the dark dorsal stripe extending about half way down the sides; there is also a dot of the same color on each side of this segment close to under surface. On the sides of the fourth and sixth segments are several additional brown dots, very small. The tenth and eleventh segments have an oblique brown streak on each side, with a small spot of the same color placed below it. The sides of body have five or six white oblique lines.

Under surface green, with a whitish bloom; a patch of brown on each side in continuation of spots on tenth and eleventh segments; a patch of the same also behind the last pair of prolegs.

Before entering the pupa state these larvæ assumed a delicate pink color, the dorsal stripe becoming darker, the other lines paler. Length .60 in. Head, color and markings as before. Body above dull whitish pink; second segment greenish; dorsal stripe on third, fourth and fifth segments very dark brown, widest on fifth, where there is a spot of the same color on each side of it. The lines bordering dorsal crest, oblique lines on sides, and edging of under surface, all pale pink. On the hinder segments the anterior portion of dorsal stripe is widened, assuming the form of a triangular patch as before, its color scarcely so dark as that on anterior segments.

Under surface green with a yellowish tint, feet and prolegs of the same shade.

One of these became a chrysalis on the 27th of June. Length of pupa, .40 in. Color pale brown, sprinkled with many dots of a darker shade, and thickly covered with short yellow hairs. A ventral line of dark brown along

posterior segments. Under surface much paler. This description was taken June 30th. The imago appeared on the 13th July.

Among the first lot of larvæ secured one differed materially from the others in its appearance just before entering the chrysalis state. The body assumed a *deep green color* with the same dark brown dorsal markings, while the yellow edging of dorsal crest appeared very prominent in consequence of the deepening of general color, on posterior segments it was indistinct. The bordering around body close to under surface was dull pink, and the oblique lines on sides of body scarcely perceptible. The under surface was a little deeper in color than upper; feet faintly tipped with brown.

This specimen became a pupa June 24th, and the following description was taken on the 28th. Length, .40 in. Color, *brownish black*, thickly covered with short yellowish hairs, with three or four faint brown spots on each side of the ventral line on posterior segments. Wing cases mottled with pale brown, under surface paler. This produced the imago July 10th.

On the first of July some additional specimens of the larva were taken by Mr. E. B. Reed in another locality, also on oak. Several of these were kindly placed at my disposal. Some were of the normal cast as first described, while two or three appeared very distinct. The head had the same color and markings in all; but in one case the *body was pale brown* with a pinkish tinge, thickly covered with short whitish hairs; *no yellow or other markings*. Under surface yellowish-green. In a second specimen the color was of the same pale brown shade, but the yellow markings were present. Both these examples presented a marked contrast with the common form of whitish or greenish-white larva with broken dorsal stripe.

In all these cases the imago appeared identical—after a careful examination I could not detect any difference worthy of notice. Two of the common form of larvæ produced each three dipterous parasites, which escaped from the larva when full grown, and produced pupæ .19 in. in length, nearly oval in form; color dark brownish-red. One of these produced the imago on the 11th of July. The insect has not yet been determined.

In this interesting series of specimens we have the same imago produced from

First—A dull *white* or *whitish-green* larva, with *green* dorsal stripe and whitish lines, producing a *pale-brown* chrysalis.

Second—A *deep green* larva with *dark brown* dorsal stripe and *yellow* lines, producing a brownish-black chrysalis.

Third—A *pale brown* larva with a pinkish tinge, *with no dorsal stripe or other markings*.

Fourth—A *pale brown* larva with *yellow* lines.

Thus showing variations as wide as those marking some distinct species.

The figure of this larva given in Boisduval and Leconte (Pl. 29, fig. 4), although very imperfect, is evidently intended to represent the normal form of this larva. It is there stated to feed on different species of thorn (*Crataegus* —).

A NEW SPECIES OF *ANARTA* FROM NOVA SCOTIA.

BY THE EDITOR.

In the Proceedings and Transactions of the Nova Scotian Institute of Natural Science (1868-9, p. 78-87), I have given a list of some specimens of Nova Scotian Lepidoptera, sent me for determination by the esteemed President of the Institute, J. Matthew Jones, Esq., of Halifax. Among these was included a new species of *Anarta*, the description of which I re-print here, as many of those interested in this department of Entomology may not have access to the original publication.

"*Anarta Acadensis*, Bethune (Pro. Trans. N. S. Inst. Nat. Sci., 1868-9, p. 84). The pretty little species of this genus are chiefly confined to mountainous and sub-arctic regions; one, however, is taken all over England, and another *A. luteola*, Grote & Rob., has been found in the neighborhood of Quebec; Dr. Packard (Pro. Boston Soc. Nat. Hist. Oct. 17, 1866), has described several species taken in Labrador. The following is a description of our species:—

"Anterior wings dull brick red, sparsely powdered with black scales. Basal line indistinct, doubled, slightly dentate, black; transverse anterior line black, perpendicular to costa for nearly half its length, then curved outwards forming an irregular arc to the inner margin. Median space darker, with a transverse central black shade; orbicular spot very conspicuous, creamy white, with a few scattered ferruginous scales in the middle, narrowed posteriorly and produced till it meets the edge of the reniform; this spot is of the normal shape, concolorous with the rest of the wing, conspicuously bordered with white, except inferiorly where it is open and encroached upon by the dark central shade. Transverse posterior line, black, fine, forming a very convex arc outside of the reniform spot. Subterminal and terminal spaces paler; subterminal line rather broad, distinct, black, arising from a triangular black spot on the costa, slightly wavy, parallel to the outer margin; terminal line deep black, very distinct; fringes concolorous with the wing.

"Posterior wings shining, straw-yellow, with a broad well-defined black border, which is slightly excavated interiorly just before the anal angle; costa, base and inner margin broadly discolored with black scales; fringes golden yellow at apex, pale yellow inferiorly.

"Under side of anterior wings shining, the costa narrowly, and the outer margin broadly, reddish-yellow, especially at the apex; inner margin rather broadly pale yellow; all the rest uniformly deep black. Posterior wings shining, pale yellow, with the costa and apex broadly irrorate with bright ferruginous scales, and a narrow ill-defined submarginal band; fringes pale yellow.

"Antennæ pale ferruginous, with a slight pubescence. Head and thorax ferruginous. Abdomen cinereous above, darker from numerous black scales below; anal tuft ferruginous. Tarsi annulated.

"Alar expansion 1.15 inch. Length of body 0.50 inch.

"*Habitat*, Nova Scotia. (No. 281, J. M. Jones). This very pretty little moth may be readily distinguished by its color and the conspicuous peculiarly shaped orbicular spot.

"Halifax: rare, taken in July at Ashbourne.—J. M. J."

LIST OF COLEOPTERA,

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from page 54.)

STAPHYLINIDÆ.

FALAGRIA, <i>Mann.</i>	*Capucinus, <i>Er.</i>	XANTHOLINUS, <i>Serv.</i>
Dissecta, <i>Er.</i>	Molochinus, <i>Er.</i>	Fulgidus, <i>Er.</i>
*Venustula, <i>Er.</i>	CREOPHILUS, <i>Steph.</i>	Cephalus, <i>Say.</i>
LEUCOPARYPHUS, <i>Kraats.</i>	Villosus, <i>Kirby.</i>	Hamatus, <i>Say.</i>
*Silphoides, <i>Kr.</i>	LEISTOTROPHUS, <i>Perty.</i>	BAPTOLINUS, <i>Kr.</i>
COPROPORUS, <i>Kr.</i>	Cingulatus, <i>Kr.</i>	*Filicornis, <i>Payk.</i>
Ventriculus, <i>Kr.</i>	OCYPUS, <i>Kirby.</i>	LATHROBIUM, <i>Grav.</i>
TACHINUS, <i>Grav.</i>	Ater, <i>Er.</i>	Grande, <i>Lec.</i>
*Flavipennis, <i>Dej.</i>	STAPHYLINUS, <i>Linn.</i>	Punctulatum, <i>Lec.</i>
*Memnonius, <i>Grav.</i>	Maculosus, <i>Grav.</i>	Angulare, <i>Lec.</i>
Fumipennis, <i>Er.</i>	*Mysticus, <i>Er.</i>	Concolor, <i>Lec.</i>
Picipes, <i>Er.</i>	Vulpinus, <i>Nord.</i>	*Armatum, <i>Say.</i>
Fimbriatus, <i>Grav.</i>	Fossator, <i>Grav.</i>	*Longiusculus, <i>Grav.</i>
Limbatus, <i>Mels.</i>	STAPHYLINUS (<i>contin'd</i>).	*Collare, <i>Er.</i>
TACYPORUS, <i>Grav.</i>	Badipes, <i>Lec.</i>	CRYPTOBIUM, <i>Mann.</i>
Jocosus, <i>Say.</i>	Cinnamopterus, <i>Grav.</i>	Bicolor, <i>Er.</i>
CONOSOMA, <i>Kr.</i>	Violaceus, <i>Grav.</i>	Pallipes, <i>Nord.</i>
Crassum, <i>Lec.</i>	Capitatus, <i>Bland.</i>	*Latebricola, <i>Nord.</i>
Basale, <i>Lec.</i>	PHILONTHUS, <i>Curtis.</i>	STILICUS, <i>Latr.</i>
BOLETOBIUS, <i>Leach.</i>	Cyanipennis, <i>Er.</i>	*Angularis, <i>Er.</i>
*Niger, <i>Er.</i>	Aeneus, <i>Nord.</i>	*Dentatus, <i>Er.</i>
*Cincticollis, <i>Er.</i>	Blandus, <i>Er.</i>	LITHOCHARIS, <i>Er.</i>
Cinctus, <i>Er.</i>	Promptus, <i>Er.</i>	Confluens, <i>Er.</i>
*Rostratus, <i>Lec.</i>	Debilis, <i>Er.</i>	SUNIUS, <i>Steph.</i>
*Longicæps, <i>Lec.</i>	Lomatus, <i>Er.</i>	*Prolixus, <i>Er.</i>
QUEDIUS, <i>Steph.</i>	*Fulvipes, <i>Nord.</i>	*Linearis, <i>Er.</i>
Fulgidus, <i>Er.</i>	*Aterrimus, <i>Er.</i>	SUNIUS (<i>continued</i>).
*Lævigatus, <i>Er.</i>	Apicalis, <i>Er.</i>	Longiusculus, <i>Er.</i>

PÆDERUS, <i>Grav.</i>	OXYTELUS, <i>Grav.</i>	TRIGONODEMUS, <i>Lec.</i>
Littorarius, <i>Grav.</i>	Sculptus, <i>Grav.</i>	Striatus, <i>Lec.</i>
STENUS, <i>Latr.</i>	TROGOPHLEUS, <i>Mann.</i>	ANTHOBIUM, <i>Steph.</i>
*Colon, <i>Say.</i>	*Morio, <i>Er.</i>	Protectum, <i>Lec.</i>
Juno, <i>Fab.</i>	ANTHOPHAGUS, <i>Grav.</i>	PROTEINUS, <i>Latr.</i>
OXYPORUS, <i>Fab.</i>	*Cæsus, <i>Er.</i>	*Parvulus, <i>Lec.</i>
Rufipennis, <i>Lec.</i>	LESTEA, <i>Latr.</i>	MEGARTHUS, <i>Steph.</i>
*Femoralis, <i>Grav.</i>	*Biguttula, <i>Lec.</i>	*Americanus, <i>Sachse.</i>
Lateralis, <i>Grav.</i>	ACIDOTA, <i>Steph.</i>	Angulicollis, <i>Mühl.</i>
BLEDIUS, <i>Steph.</i>	*Subcarinata, <i>Er.</i>	OLISTHÆRUS, <i>Er.</i>
Fumatus, <i>Lec.</i>	*Patruelis, <i>Lec.</i>	Nitidus, <i>Lec.</i>
PLATYSTETHUS, <i>Mann.</i>	OLOPHRUM, <i>Er.</i>	GLYPTOMA, <i>Er.</i>
Americanus, <i>Er.</i>	*Emarginatum, <i>Er.</i>	*Costale, <i>Er.</i>
HISTERIDÆ.		
HOLOLEPTA, <i>Payk.</i>	Coarctatus, <i>Lec.</i>	*Deletus, <i>Lec.</i>
Fossularis, <i>Say.</i>	*Cylindricus, <i>Payk.</i>	TERETRIUS, <i>Er.</i>
HISTER, <i>Linn.</i>	*Gracilis, <i>Lec.</i>	*Americanus, <i>Lec.</i>
Interruptus, <i>Beauv.</i>	PHELISTER, <i>Mars.</i>	PLEGADERUS, <i>Er.</i>
Merdarius, <i>Payk.</i>	*Subrotundus, <i>Mars.</i>	Transversus, <i>Say.</i>
*Harrisii, <i>Kirby.</i>	TRIBALUS, <i>Er.</i>	ACRITUS, <i>Lec.</i>
Fœdatus, <i>Lec.</i>	*Americanus, <i>Lec.</i>	*Exiguus, <i>Lec.</i>
*Cognatus, <i>Lec.</i>	PAROMALUS, <i>Er.</i>	SCAPHIDIIDÆ.
Margenicollis, <i>Lec.</i>	—?	SCAPHIDIUM, <i>Oliv.</i>
Depurator, <i>Say.</i>	SAPRINUS, <i>Leach.</i>	4 Pustulatum, <i>Say.</i>
Abbreviatus, <i>Fab.</i>	Distinguendus, <i>Mars.</i>	Piceum, <i>Mels.</i>
*Sedecim striatus, <i>Say.</i>	*Pensylvanicus, <i>Er.</i>	SCAPHISOMA, <i>Leach.</i>
Americanus, <i>Payk.</i>	*Conformis, <i>Lec.</i>	Convexum, <i>Say.</i>
*Carolinus, <i>Payk.</i>	Assimilis, <i>Er.</i>	TOXIDIUM, <i>Lec.</i>
LeContei, <i>Mars.</i>	*Scupularis, <i>Lec.</i>	*Gaminaroides, <i>Lec.</i>
Parallelus, <i>Say.</i>	Fraternus, <i>Lec.</i>	

MISCELLANEOUS NOTES.

LARVA OF *HELIOTHIS ARMIGERA*.—At a recent meeting of the Entomological Society of London, Eng., "Mr. J. Jenner Weir exhibited two specimens of *Heliothis armigera*, Linn. (*H. umbrosus*, Grote), bred from larvæ which fed in tomatoes. An importation of tomatoes from Spain or Portugal had been greatly damaged by a number of green larvæ, with black lines and spots, which fed in the fruit, where there was apparently juice enough to drown them, and which ultimately produced the moths exhibited." This insect has

* Species marked with an asterisk have not been before included in the list of Canadian Coleoptera.

been taken in all parts of the world, and of late years in the United States. In Illinois and Kentucky the larva has been very destructive to Indian Corn, and in the former State to the tomato as well (*Amer. Ent.*, i. 212). Mr. Glover has found it feeding in a young pumpkin; but it is best known in the United States as the Cotton Boll-worm, from the injury it inflicts upon the cotton crop. It is probable also that it attacks Indian Corn in Canada, (*Vide C. Farmer*, 1869, p. 425).

CAPTURES AT NORTH DOURO.—An attack of ague—for although that depressing complaint is happily of infrequent occurrence in our village, it was exceedingly prevalent last year—and a subsequent lengthened absence from home for the recuperation of health, prevented me from devoting much time, last summer, to the capture of entomological specimens for my cabinet.

Perhaps the most interesting addition I made to my collection was a very good specimen of the *Thyreus nesus*.

The *Colias philodice* appeared in great abundance, noticed chiefly around the puddles on the roads.

Among the *Coleoptera* captured was the “one-coloured *Prionus*,” *Prionus unicolor*, called now, I believe, *Orthosoma cylindricum*. It is a good specimen, measuring $1\frac{1}{2}$ in., exceeding by $\frac{1}{4}$ in. another specimen previously included in my collection.

Some of the “Buprestians,” particularly the *Buprestis Virginica*, we find constantly in our neighbourhood. Last year I captured the *Buprestis fulvoguttata*, the “tawny-spotted Buprestis;” it measures a little over $\frac{1}{10}$ in.

The large “Capricorn beetles,” *Monohammus titillator*, were unusually abundant last season. I captured numerous specimens for the purpose of measuring their antennæ, one pair of which had attained to the unusual—as far as my experience extends—length of $3\frac{1}{2}$ in.

I also added a “Tree-hopper,” *Cicada canicularis*, to my collection. Both my specimens are of the same length, a little over $1\frac{5}{16}$ in. to the end of the wing covers.

My Dahlias, last year, were infested with *hemiptera*. Indisposition at the time of their appearance disinclined me from the trouble of endeavouring to ascertain even the group to which they belonged. They were about $\frac{1}{10}$ in. in length, and prettily coloured.

Around my currant bushes were playing, during the summer months, innumerable “Ichneumon flies.” I never saw so many congregated within a similar space before. They were of different sizes and colours. I noticed one of the larger ones, of a steel-blue colour, with a linear body, entangled in a spider’s web. Madame Arachne, however, soon discovered that she had “caught a Tartar;” for, after a few ineffectual struggles to escape, the

Ichneumon managed to insert her ovi-positor into the body of the spider, retaining it there for a longer period than would have sufficed for the deposit of an egg—probably the original intention—in fact, until the spider was, or appeared to be, dead. I need scarcely add, that I always welcome the appearance of the ichneumons, cruel as is their mode of propagation.

I saw a *Tremex columba* on one of the window-sills of my church. It was beyond my reach, and, having specimens in my cabinet, I took no pains to secure it.

And, to conclude this gossiping communication, I found, on a spruce tree, two *larvæ* of the *Orgyia leucostigma*.—V. CLEMENTI, North Douro, Ont.

RASPBERRY GALL.—Towards the end of the summer of 1868, while entomologizing in the neighborhood of Billings's Bridge, south of Ottawa, in company with Mr. B. Billings, I noticed that the roots of the common raspberry, growing in certain localities, were attacked by a species of gall-fly. I recognized this gall as similar to one which I found on the 31st May, at a place called La Table Bay, Labrador. The galls are generally attached to the roots, but they sometimes occur on that portion of the stem which is covered with earth. I collected a quantity of the Labrador galls, which were placed in a paper bag, and brought to Quebec, where the (*Hymenopterous*) insects emerged, but unfortunately the galls and insects were lost on my removal to this city. The galls are small, spherical, and sometimes found in clusters, each being a cell, containing one insect. I visited the locality near this city this spring, but found the place covered with water, and I have not had another opportunity to look after them. I believe it was not described up to 1868. Do any of your correspondents know it?—WILLIAM COUPER, Ottawa, Ontario.

AN ODD PLACE FOR A HUMBLE BEE'S NEST.—Our country butcher being for a long time annoyed in his shop with humble bees, was at a loss to find out where they all came from. His shop is a wooden erection, having a broad running beam at the top of the wall to support the roof. The windows are open in the summer and the apertures covered with hexagon wire netting. On carefully searching the premises, he discovered on the top of this beam, at the foot of a rafter, a thriving colony of humble bees, snugly esconced among the wool in a *sheep's tail* which he had cut off and thrown there some time in the spring. At my request the butcher promised to preserve it, but unfortunately, when I next went to see it, I learned that some rats had found it out and destroyed it.—R. D. CRUDEN, in *Science Gossip*. [Last summer I observed a somewhat similar instance. In the spring I carelessly threw a buffalo skin over a beam in my barn, in such a way that the sides hung down with the hairy portions inwards. Sometime afterwards, suspecting the

depredations of moths, I proceeded to beat the skin with a stick, and was considerably astonished to hear a great buzzing, and find myself attacked by some enraged humble bees, who had made their nest among the hair. After a time the skin was knocked down upon the floor, and the bees deserted their novel quarters.—C. J. S. B.]

ENTOMOLOGICAL SOCIETY OF CANADA.

At a recent Meeting of the Council of the Agricultural and Arts Association of Ontario, the following resolution was adopted :—

“That the Secretary notify the Entomological Society that their Report will not be required until about the 1st of October; also that the grant will be paid at the same time as the County Societies; also that they will be furnished with room for their Cabinet in the Agricultural Hall.”

At an informal meeting of some members of the Council of the Entomological Society, who met in London, on the 15th ult., it was resolved that the Report for 1870, should comprise a description of the insects noxious and beneficial to the following productions of the field, the garden and the orchard : wheat, potatoes, peas, hops : the apple, plum, grape, currant and gooseberry ; the strawberry, cabbage, cucumber and squash, and any other crop, fruit, or vegetable that may be attacked during the coming season by a new ravager or in a more than ordinary degree. Members of the Society, and the public generally are requested to kindly render such assistance as may be in their power, by forwarding specimens and furnishing information of insect depredations, to either the general Secretary, Rev. C. J. S. Bethune, Credit, Ont., or to the Secretary of the London Branch, E. B. Reed, Esq., London, Ont.

Specimens of noxious and beneficial insects in all their stages, and examples of their work and operation, are earnestly requested for the Cabinet of the Society. They may be sent by mail, with perfect safety, if enclosed in stiff pasteboard, or tin boxes of convenient size, and packed with a little cotton-batting, wool, or other soft substance. They should never be enclosed in a letter without some such protection, nor should dead specimens be sent loose in a box. Living larvæ should be sent in *air-tight boxes*, with sufficient food to last them on their journey; otherwise they die on the road and shrivel so much as to become unrecognizable. Dead larvæ should be carefully packed in small vials filled with diluted spirits. As much information as can be afforded about the specimens is always most desirable.

REPORT OF THE LONDON BRANCH,

FOR THE YEAR ENDING DECEMBER 31, 1869.

Your Committee present the Fifth Annual Report. We congratulate the members on the prosperous state of the London Branch. The Financial Statement shows a small balance in hand, after paying off some \$45 of the debt on the

Society's Apparatus, and we trust that during the present year this debt will be greatly reduced.—The Society numbers 30, and we hope to procure some fresh additions to our ranks.—We feel that the Society is greatly indebted to those of our members, who, not being practical entomologists themselves, yet aid and encourage us by their subscriptions in prosecuting our useful work. The last Provincial Exhibition bore good testimony to the industry and perseverance of London Collectors. The display of Insects there, was probably the finest ever yet exhibited in the Dominion. We feel proud in recording that Four Prizes were obtained, amounting to \$26 50. This sum, in accordance with our usual custom, was added to the funds of the Branch. We must not omit to notice that Entomology has been started at the Hellmuth College, and the Head Master, the Rev. A. Sweatman, is desirous of giving the science every encouragement.

It is with pleasure that we now record the success of the Parent Society in obtaining aid from government. Upon a strong application to the Agricultural Association of Ontario, the Board has made a grant of \$400 for the present year, conditional on a Report being made and collections procured, and the publication of the CANADIAN ENTOMOLOGIST being continued. This is, indeed, a great success, and we trust that through this wise liberality the Society may be enabled to diffuse, far and wide, a more practical knowledge of Entomology. The CANADIAN ENTOMOLOGIST has entered on its second year, and bids fair to obtain a good share of success. We notice that its pages are now doubled. We earnestly request our members to contribute to its pages any interesting facts in Entomology that may come under their notice.

We also beg to inform the members that the Parent Society in acknowledgment of the industry and importance of the London Branch, has donated \$75 for the purchase of a Cabinet for the Branch; any contributions of Insects will therefore be most welcome.

In conclusion, we trust that the members will use their best endeavors to promote the interests of the Society, remembering that our aim is not a selfish one, but that the practical results of our labor affect the interests of a very large portion of our community.

EDMUND BAYNES REED.

Sec. and Treasurer.

GEORGE M. INNES.

President London Branch.

BOOKS RECEIVED.

Nature.—A weekly illustrated Journal of Science. Macmillan & Co., London. Nos. 9-15. The objects of this excellent new publication are, as stated in its prospectus, "to place before the general public the grand results of scientific work and scientific discovery, and to urge the claims of science to a more general recognition in education and in daily life; and to aid scientific men themselves, by giving early information of all advances made in any branch of natural knowledge throughout the world, and by affording them an opportunity of discussing the various scientific questions which arise from time to time." The numbers before us bear ample witness to the satisfactory mode in which these objects are being carried out; they contain a large number of practically scientific articles by

eminent writers, accounts of recent scientific discoveries, valuable reviews of new works in all departments of science, reports of meetings, and abstracts of important papers read before learned societies in all parts of the world, much interesting correspondence and notes of a general character. A regular perusal of this publication cannot fail to be of great benefit to any naturalist or scientific student. No. 14 contains some copious extracts from what appears to have been a very able and interesting address delivered to the Entomological Society of London by the President, Mr. W. H. Bates. No. 15, an article on "Entomology in America," referring especially to Dr. Packard's *Guide to the Study of Insects*.

Hardwicke's Science Gossip—Nos. 61 and 62, January and February, 1870—Contains many entomological articles and notes, as well as much that is interesting in other departments of science.

Le Naturaliste Canadien, Vol. ii., Nos. 2 and 3; January and February, 1870. The former number contains a continuation of the list of *Coleoptera* taken at Portneuf, R. Q., which it is interesting to compare with Mr. Pettit's of Grimsby, Ont. The latter number includes an article on "Agriculture and Entomology," being a petition presented by the Editor to the Council of Agriculture at Quebec, drawing their attention to the ravages of insects, and calling upon them to render assistance to the work of investigating their natural history.

The Canadian Naturalist and Quarterly Journal of Science. Montreal: Dawson Brothers. Vol. iv., No. 3, Sept. 1869. Contains "Notes on the Small Cabbage Butterfly, *Pieris rapæ*," by Mr. Ritchie, and a review of Harris' *Entomological Correspondence*, in our department of natural history.

The Canadian Builder and Mechanics' Magazine. Dyas & Wilkens, London, Ont., Jan. 1870. An illustrated monthly publication, edited by practical men, who are engaged in these departments of industry.

A Preliminary List of the Butterflies of Iowa. By S. H. Scudder (From the Transactions of the Chicago Academy of Sciences). Embraces 46 species, including the following new species: *Chrysophanus Dione*, *Apatura Proserpina*, *Nisoniades martialis*, and *Hesperia Iowa*.

Proceedings of the Boston Society of Natural History. Vol. xiii., pages 161 to 192.—*The American Entomologist*. Vol. ii., Nos. 3 & 4.—*The American Naturalist*. Vol. iii., No. 11.—*The American Agriculturist*—*The Canada Farmer*.—*The Maine Farmer*.—*New York Sun*—*Once a Month*, *Arthur's Home Magazine*, and *The Children's Hour*.—*Newman's Entomologist*. Nos. 73 and 74 (from Mr. Reeks).—*The Rural New Yorker*.—*Report of the Fruit Grower's Association of Ontario for 1869*.—*The Gavel*. No. 2. Toronto, February, 1870. A new Masonic Magazine, edited by Dr. R. Ramsay.

Proceedings and Transactions of the Nova Scotian Institute of Natural Science of Halifax, N. S.—Vol. ii, part 3, 1868-9. It is pleasing to find such tokens of prosperity and success manifested by a scientific society as are apparent in the handsomely printed volume before us. It contains, besides the proceedings of

the Institute, thirteen papers read at its meetings by members engaged in different branches of science. In Entomology there is a paper on Nova Scotian Lepidoptera by the Rev. C. J. S. Bethune and Mr. J. M. Jones, and a preliminary synonymic List of Coleoptera of the same Province, by the latter gentleman. The Part is illustrated by 5 plates and diagrams, including a lithographic drawing by Mr. Jones of *Anarta Acadiensis*, Bethune.

ADVERTISEMENTS.

FOR SALE CHEAP.—A fine Oxy-Hydrogen Dissolving-View Apparatus, with Polariscopes, Microscope, and Kaleidoscope complete; and a large collection of suitable slides. Apply to E. B. REED, London, Ont.

PETITES NOUVELLES ENTOMOLOGIQUES.—On the 1st and 15th of each month.—This periodical contains a resume of all news concerning entomologists and their doings, and is indispensable to all who wish to keep themselves posted up in current entomological information. Subscription (for Canada) \$1.20 a year, post free. All communications to be addressed to Mons. E. Deyrolle, fils, 19 Rue de la Monnaie, Paris, France. Canadian Subscribers can remit in two or three cent postage stamps.

N.B.—We shall be prepared in a few weeks to supply subscribers in Canada and the United States with the above publication at the price named, \$1.20 a year, post free. Applications may be sent at once.—Ed. C. E.

CLUB RATES.—In addition to the Club rates announced on the second page of the wrapper, we are enabled to offer the following:

The American Agriculturist (\$1.50), and the *Canadian Entomologist* (\$1), for \$2.

Once a Month (\$2), and the *Canadian Entomologist* (\$1), for \$2.25.

Arthur's Home Magazine (\$2), and the *Canadian Entomologist* (\$1) for \$2.25.

The Children's Hour (\$1.25), and the *Canadian Entomologist* (\$1), for \$1.75.

The Educator (36 cents), and the *Canadian Entomologist* (\$1), for \$1.05.

Petites Nouvelles Entomologiques (\$1.20), and the *Canadian Entomologist* \$1 o \$2.

AGENTS FOR THE CANADIAN ENTOMOLOGIST.

CANADA—E. B. Reed, London, Ont.; W. Couper, Naturalist, Ottawa, Ont.; G.

J. Bowles, Quebec, P.Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y.

Green, Newport, Vt.; R. Trestrail & Son, The Bazaar, Dixon, Ill.

FRANCE.—E. Deyrolle, fils, 19 Rue de la Monnaie, Paris.

ENGLAND.—We hope to be able to announce the name of an agent in London in our next issue.

* * We regret that this number should have been delayed by unavoidable circumstances, beyond the time announced for its issue. April 1st is the date set down for the issue of No. 6; communications for insertion should be in our hands at least ten days previously.

The Canadian Entomologist.

VOL. II.

TORONTO, APRIL 8, 1870.

No. 6.

NOTE ON *AMPHIPYRA TRAGOPOGONIS*, LINN.

BY THE EDITOR.

On the 6th of June, 1868, we observed for the first time a handsome green caterpillar eating some lettuce that we were growing in our grapery; thinking that it could not very well escape we merely took a rough description, as follows:—Sixteen footed caterpillar, about an inch long, pale green (almost the colour of lettuce leaves) above, deeper green below; a white dorsal line, two lateral white lines, the lower passing through the spiracles; all five lines proceeding from head to tail. Before we secured it, it did however escape probably entering the ground.

The following year, in June and early in July, we observed many similar larvæ on a number of different plants, both in the garden and in the woods. The following description of a nearly full-grown specimen was taken on the 3rd of July:—

Length 1.00 inch. Colour beautiful apple-green. Head pale green, with a dark spot on each side in front; dorsal, sub-dorsal, and spiracular lines, narrow, pure white; the spiracular lines begin on the second segment, the others on the third; on all the segments except the head and second, there are a few minute white granulations tipped with black, and terminating each in a fine hair; spiracles white; feet green.

On July 11th it formed a slight silken cocoon in the box in which it was confined, having no earth to burrow into, and there assumed the pupa state. The imago appeared on the 3rd of August, and proved to be a specimen of *Amphipyra tragopogonis*, Linn.

This excessively common moth, found all over the Province of Ontario, and also in Quebec, appears to be an importation from Europe, where, according to Guénée and Stainton, it is very abundant. Its specific name is derived from the Salsify, or Vegetable-oyster plant (*Tragopogon*), on which, as well as on Spinach, Dock, and other plants, it feeds according to Fabricius. In England it is called the 'Mouse' moth, either from its colour or its habit "of creeping into houses, and secreting itself in blinds, and when dislodged, if it

falls on its back or belly, of shuffling along in a very peculiar manner" (Stainton). In this country we often find it about venetian shutters in the summer time, and through the winter its remains are very abundant in cobwebs about the windows of little-used buildings,—as, for instance, in the Cemetery Chapel at Cobourg a few years ago.

The imago may be at once recognized by the three black dots,—one on the disk, and two occupying the place of the reniform spot,—on the dull greyish-brown fore-wings; the hind-wings are much paler, shaded exteriorly, and immaculate; the abdomen is flattened; and the whole insect has a satiny lustre in certain lights.

There is another equally abundant species of this genus, the Copper Underwing (*A. pyramidoides*, Guén.), which can usually be taken in great numbers in August and September. Its larva is stated (*Amer. Ent.* ii. 26) to feed on the leaves of the Grape, Poplar, and Red-bud (*Cercis canadensis*); and by Guénée, on Oaks (*Quercus*). Grote (*Pro. Ent. Soc. Phil.* iii. 86) describes, under the name of *A. inornata*, another species from Canada, taken by Mr. Saunders, but we have never met with it, and are inclined to think from his description that it is merely a variety of the foregoing.

ON THE LARVÆ OF SOME LEPIDOPTERA.

BY W. SAUNDERS.

ARCTIA CELIA, *Saunders*.

A single full grown specimen of the larva of this species was found under a log in a wood near London on the 11th of June. Length one inch. Head black and shining.

Body above *brownish black*, closely covered with tufts of moderately long, stiff hairs, proceeding from elevated shining tubercles. Hairs and tubercles a little darker than the surface of body *excepting along the sides, where, although the tubercles continue the same, the hairs are changed to a yellowish-brown color.*

Under surface brown, with a slight greenish tint; fifth, sixth, eleventh, and twelfth segments are each belted with a series of tufts of short yellowish-brown hairs, in continuation of those above. Feet black and shining. Prolegs yellowish-brown and hairy.

This larva changed to a chrysalis on the 13th of June, and produced the imago on the 30th of the same month.

CIDARIA DIVERSILINEATA, *Hubn.*

The date of the capture of these larvæ I failed to record. It was early in summer, and they were very abundant on the leaves of the American Ivy (*Ampelopsis quinquefolia*), on which they fed.

Length from one to one and a quarter inches. Head flat, with two prominent black points or processes above, mandibles yellowish-white.

Body above dark dull brown, with a slightly reddish tint, and patches of a darker shade along the dorsal region. On each side close to under surface is a longitudinal ridge.

Under surface similar in color to upper, excepting the spaces between the feet and the two pairs of prolegs, which are of a greenish color. Feet crowded closely together, of a brownish-black color, prolegs of a similar shade. The hinder pair tinged with green.

In some specimens the general color is lighter. When alarmed they straighten themselves out, and remain for some time in that position, and being so nearly of the hue of the twigs of the plant they feed on, they thus often escape detection.

MAMESTRA ARCTICA, *Encyc.*

In No. 3 of the present volume of the *Entomologist*, C. S. Minot, Esq., of Boston, published some interesting notes on the eggs of this species. Observations made last year enable me to add another fragment to the knowledge we have of the history of this—one of our commonest moths.

On the first of June two full grown specimens of the larvæ were found under turf—they probably fed on the roots of the grass, &c.

Length one and a quarter inches.

Head rather large, bilobed, reddish, with a polished surface; mandibles black.

Body above dull greenish-white, smooth, shining, and somewhat semi-transparent, a little darker between segments. Second segment with a horny plate above similar in appearance to head, but of rather a darker hue. There are on each segment a few very small brownish dots, from each of which there arises a single fine brownish hair. Sides of body much wrinkled; terminal segment small, brownish-black; spiracles black.

Under surface similar to upper, feet brown, prolegs tipped with black. These changed to chrysalides about the 3rd of June, and produced the imago in the latter part of the same month.

In a previous year I found the same larva full grown as late as the 26th of June.

DRYOCAMPA RUBICUNDA, *Fab.*

Larva found feeding on silver maple July 30th.

Length one inch, cylindrical. Head rather small, flattened, in front bilobed, pale orange, with a black dot on each side below, near mandibles.

Body above yellowish-white, thickly covered with minute whitish granulations, only visible with a magnifying lens, with a dorsal and three lateral

stripes of pale green, rather indistinct. Second segment greenish-white with a row of six black dots or minute tubercles, but slightly raised on its anterior edge. *Third segment with two black horns nearly one-tenth of an inch long*, one on each side of the dorsal line and spreading outwards, and forward below these on each side are two small black tubercles. Each segment behind this to eleventh inclusive has a transverse row of six of these black points or tubercles, those close to under surface being largest, those above much smaller, the upper ones scarcely visible without a magnifying glass. On twelfth and thirteenth segments these tubercles are a little more prominent and about equal sized throughout, numbering six on twelfth and three on thirteenth segments. Anal lid pale green, with its outer edge fringed with eight small black tubercles, so small as to be scarcely visible. On sides of twelfth segment, close to under surface, and extending slightly into the segments on each side, is a pale reddish-orange patch or short stripe nearly the color of head.

Under surface glossy green, with a faint whitish line down the middle and many small blackish dots or tubercles, some of which are arranged in a longitudinal row outside feet and prolegs. Feet dark-brown, nearly black, shining; prolegs pale green.

On the 28th of August these larvæ were about full grown.

Length $1\frac{3}{4}$ inches. Head as before. Horns on third segment fully one-tenth of an inch long. Upper tubercles on middle and hinder segments quite distinct. Reddish patch on sides of posterior segments larger, extending over 11th, 12th and part of 13th segments, but less bright in color than head.

Under surface deeper green, feet pale reddish, prolegs pale green dotted with black.

These entered the ground shortly after and changed to chrysalides, producing the imago early the following summer.



INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR

From Kirby's Fauna Boreali-Americana: Insecta.

I.—COLEOPTERA.

For ten years we have been trying, and trying in vain, both in England and America, to obtain a copy of Kirby's descriptions of the insects of the Northern parts of British America, contained in the fourth volume of Richardson's *Fauna Boreali-Americana*, published at Norwich in 1837. Many of our friends have been making similar attempts, and always with the like ill-success. We have had, however, occasional access to a copy in the library of

the University of Toronto, which, with the exception of one in the Library of Parliament at Ottawa, is the only copy we know of in Canada. By the kindness of Prof. Croft we have obtained a loan of the copy belonging to the University, and, with the full approbation of many of our friends and correspondents, we now purpose re-publishing from it in the pages of the *Canadian Entomologist* Kirby's descriptions of new species, and such other matter as may be deemed of special value or interest. As the work consists of upwards of 300 quarto pages, it will be necessary for us to omit almost everything except the descriptions of species that cannot be obtained elsewhere, in order to accomplish the republication within a reasonable time, and without trespassing too much upon our limited space. Though we shall thus depart a little from the expressed intention of only publishing original matter in this Journal, we feel assured that all our readers will be pleased to have brought before them descriptions of Canadian insects to which they can hardly otherwise obtain access. For convenience of reference the paging of the original work, and any notes we may add, will be enclosed in square brackets.

[8] FAMILY CICINDELIDÆ.

* *Labrum unidentate*.

1. *CICINDELA HIRTICOLLIS*, Say.—Locality not stated. [For description, *vide* Say's Ent. ii. 423.]

[9] 2. *CICINDELA REPANDA*, De Jean.—Locality not stated.

Very like the preceding species, but the labrum is shorter and less prominent in the middle; the lateral margin of the elytra is not continuously white; the lower limb of the humeral crescent slopes towards the apex of the elytrum; the broken or S-shaped band terminates in a streak at the margin: all the markings also of the elytra are buff coloured rather than white; and the minute mucro or point that terminates the suture, and the serrulations of the apex of the elytra are less conspicuous.

De Jean regards this species as synonymous with *C. hirticollis*, but, if I am correct in my reference to him, of which I have little doubt, they are clearly distinct.

3. *CICINDELA PROTEUS*, Kirby.—Length of body 5½ lines. This species, of which several specimens were taken in the expedition, appears to abound in North America. Dr. Bigsby met with it in Canada, and there was a specimen in the late Mr. Marsham's collection, probably from the United States.

Similar to *C. repanda*, but instead of the humeral and terminal crescents, in all the varieties, are four white dots, two at the base and two at the apex of the elytra; the middle broken or tortuous band resembles the figure 7 reversed, and does not terminate in a marginal streak. The body underneath,

as usual, is golden-green, or green with clouds of blue, above it is dark-brown with a tint of copper.

Variety B. With the apical dots not larger than the humeral.

C. With an interrupted crescent at the apex.

D. With three apical and two humeral dots; intermediate band internally abbreviated.

E. Like the last, but with only one humeral dot.

[This is *C. duodecim-guttata*, Dej.; it is commonly taken in many parts of Canada.]

* *Labrum tridentate*.

[10] 4. *CICINDELA OBLIQUATA*, *De Jean*.—Many taken in the expedition, and apparently abundant in N. America. I received it many years since, but without a name, from my lamented friend Prof. Peck.

Body above greenish-copper, underneath golden-green clouded with blue. Labrum white, tridentate, slightly prominent in the middle; mandibles white at the base, black at the tip; palpi black; labial with the intermediate joint rufous, darker at the tip. Elytra with a large white humeral crescent, extended at the lower end obliquely beyond the middle; mesal band bent downwards, recurved at the end, and connected by a marginal line with a crescent at the apex. In the male the intermediate joint of the labial palpi is white, and the mesal band is not connected with the terminal crescent.

[Le Conte (Pro. Acad. Nat. Sci. Phil., Dec. 1866, p. 362) states that this species should hereafter be known as *C. Kirbyi*, since, as he learns from a drawing made by Mr. Andrew Murray, from the type in the British Museum, it is quite distinct from any species known to him.]

5. *CICINDELA VULGARIS*, *Say*.—A common species in all N. America.

[11] 6. *CICINDELA PURPUREA*, *Oliv*.—[Very Common in most parts of Canada.]

[12] 7. *CICINDELA ALBILABRIS*, *Kirby*. Plate i, fig. 1.—Taken in lat. 64°, and also in Canada by Dr. Bigsby. [Previously described as *C. longilabris*, by Say. (Ent. Works, i. 176), We have received specimens of this species from Nova Scotia, collected by Mr. J. M. Jones, and from Quebec and New Hampshire.]

[FAMILY CARABIDÆ.]

[13] 8. *CASNONIA PENNSYLVANICA*, *De Jean*.—Two specimens taken.

9. *CYMINDIS MARGINATUS*, *Kirby*.—Piceous, thickly punctured; antennæ, mouth, dilated sides of the prothorax, lateral margin and shoulders of the striated elytra, and legs, rufous. Length of the body $4\frac{1}{2}$ lines.

One specimen of this insect was taken in the route from New York to Cumberland House, and the other in lat. 65°. It is nearly related to *C. pubescens*, Dej., but appears distinct.

[14] Body depressed and flat, as in its congeners, piceous; above densely punctured; mouth rufous: antennæ longer than the prothorax, piceo-rufous: front between the eyes transversely wrinkled: prothorax convex, with a longitudinal channel; lateral margin dilated, reflexed, and rufous: elytra striated or slightly furrowed, with the furrows and their interstices punctured; viewed on one side they appear hairy with upright ferruginous hairs; their shoulders and lateral margin are obscurely rufous; their apex obliquely truncated, and subemarginate; the legs are rufous.

Var. B. Piceo-rufous; elytra concolorate.

[In Melsheimer's Catalogue, p. 4, this species is put down as a synonym of *C. cribricollis*, Dej., and in Le Conte's List, p. 6, with a mark of interrogation under *C. reflexa*, Lec. The latter author, however, subsequently states (Trans. Am. Ent. Soc., Feb. 1869, p. 244), that both *C. Marginata*, Kirby, and *C. reflexa*, Lec., are identical with *C. cribricollis*, Dej. The species occurs in the most northern part of the United States and in Canada.]

10. CYMINDIS UNICOLOR, Kirby.—Thickly punctured, ferruginous; legs paler; lateral margin of the thorax not dilated. Length of the body $3\frac{1}{2}$ lines. One specimen only taken.

This species greatly resembles variety B of the preceding. It is however smaller and paler; the prothorax has no longitudinal channel, and its lateral margin is not dilated.

[Placed, with a mark of interrogation, as a synonym of *C. neglecta*, Hald., in LeConte's List, p. 6.]

Genus SERICODA, Kirby.

Labrum transverse, sub-quadrangular: with the anterior angles rounded. *Mandibles* acute, incurved at the apex, not toothed? *Labium* [mentum] emarginate with a minute tooth in the sinus. *Palpi*: *maxillary* 5-jointed; first joint very minute, second longer than the rest, sub-cylindrical, attenuated at the base; third ob-conical; fourth as long as the third, fusiform, truncate; fifth very minute, retractile within the fourth: *Labial* 3-jointed; joints nearly equal in length; the two first conical; the last fusiform, truncated. *Antennæ* rather incrassated toward the apex; *scape*¹ incrassated; 2nd joint the shortest, and the third rather longer than the others.

[15] *Body* depressed, narrow. *Head* triangular. *Eyes* large and prominent. *Neck* very little constricted. *Prothorax* short, channelled, widest anteriorly: with the angles rounded. *Elytra* obliquely truncated at the apex and emarginate, so that internally they terminate in an acumen. *Cubit*

¹ *Scape*. The first, and often most conspicuous joint of the antennæ, terminating below in the bulb, which inosculates in the head and acts the part of a rotula. [Definitions, &c., p. xvii.]

[*tibia* of 1st pair of legs] emarginate. *Tarsi* with the penultimate joint entire. *Claws* single, not pectinated.

The maxillary palpi of the genus here defined present an anomaly observed in no other known coleopterous genus, they appear to be furnished with a minute *fifth* joint retractile within the fourth. In one of these palpi, in the only specimen taken, this little accessory joint is not apparent, but in the other it is distinctly seen emerging from the fourth joint, or rather, as this last appears broken at the apex, it is uncovered. There is only one supposition that can reconcile this case to the general rule, that no *coleopterous* maxillary palpus shall exceed four joints, namely—that this is an effort of nature, by a reproduction, to restore the mutilated organ so as to fulfil its functions. Did the insect belong to the *Crustacea* or *Arachnida* this would be a satisfactory explanation of the anomaly, but I do not recollect any instance upon record of a genuine *insect* having reproduced a lost organ. I thought it possible that the palpi of other Predaceous beetles might contain a retractile joint, and this truncated apex seemed in some degree to favour the idea, but I did not succeed in my endeavours to discover one. [Mr. Scudder (Pro. Bost. Soc. Nat. Hist. xii. 99) describes the reproduction of lost limbs in the Walking-Stick Insect (*Diapheromera femorata*), specimens of which we have seen in his cabinet. We cannot but think that the case described above by Mr. Kirby is an instance of reproduction.]

The above structure of the palpi, if not accidental, seems to give our little insect some affinity with the *Subulipalpi* of Latreille, but its general characters and aspect appear to demand a place for it somewhere between those *Truncipennia* whose claws are not pectinated, and those who have those organs so armed.

11. SERICODA BEMBIDIoidES, Kirby.—Plate 1, Fig. 2.—Black underneath, above black-bronzed, rather silky; prothorax subtrapezoidal, with a pair of impressions behind; elytra substriated, impunctured, somewhat clouded, with a series of impressions adjoining the suture. Length of body $3\frac{1}{4}$ lines. Only a single specimen taken.

[16] Body underneath black glossy; above the black has a brassy tint, with somewhat of the lustre of silk: head, between the eyes, marked with a short, anteriorly forked furrow: prothorax sub-trapezoidal, anteriorly sub-emarginate, sides oblique with the margin reflexed, transversely very minutely wrinkled, with a pair of anterior excavations in the disk, posteriorly also somewhat impressed on each side: elytra longer than the head and prothorax together, slightly furrowed with impunctured furrows, obsoletely clouded: there is a series of about five shallow impressions near the suture.

* [Included by LeConte in the genus *Platynus*. Has been taken in Oregon.]

12. *BRACHINUS CYANNIPENNIS*, Say.—[Say's Ent. Works, ii. 91.] Several specimens of this insect were taken in the journey from New York to Cumberland House, and in lat. 54° ; it was taken also in Canada by Dr. Bigsby.

[17] 13. *CARABUS VIETINGHOVII*, Adams.—(Mem. Soc. Nat. Moscow, iii. 170; *Fischer* Ent. Russ. i. 98; *Dej.* Coleopt. ii. 61, 21.) Kirby, plate I., fig. 3.

♀. Length of the body 10 lines. Body very black and glossy. Head punctured between the eyes with confluent but not minute punctures; anterior part of the front wrinkled on each side, but the nose and upper lip are quite smooth; the seven terminal joints of the antennæ are brown: the prothorax is nearly square with the sides rounded anteriorly and the posterior angles a little prominent; it is deeply channelled, transversely wrinkled in the disk, confluent but not minutely punctured on the sides; the disk also is black, but the sides exhibit shades of dark blue and green, at the margin they are of a most brilliant ruddy copper, some of the anterior punctures also appear as if gilded: the elytra are rough and as it were reticulated with longitudinal and transverse elevations, the former nearly arranged in lines which produce deep cavities; the disk is of a fine deep blue, the sides green, and the lateral margin of the same ruddy copper as that of the prothorax. The body underneath is quite smooth in the disk, with some irregular elevations and depressions on the sides: the sides of the ante-pectus, or fore-breast, are of a fine green; the intermediate segments have each a pair of impressions from which a hair emerges. This is most visible in the ♂.

I at first regarded this splendid insect as a new species. I thought it, indeed, very near *C. Vietinghovii*, but as it did not altogether agree either with Dr. Fischer's figure or description, and was found in another quarter of the globe, I regarded it as distinct; but having received from my friend Mr. Hope, a Russian specimen of that insect, I find no difference sufficient to constitute a species. In that specimen the marginal gilding of the prothorax and elytra is greener with scarcely any of the ruddy hue of copper which gives such brilliance to the American specimen.

[A single specimen only of this magnificent beetle was brought to Mr. Kirby in the Richardson collection, and no locality is given of its capture; can it have come from Russia, and not from British America? No specimen of it has been taken in this country, so far as we are aware, since the time of that expedition, a period of over 30 years. It might have been included in the collection by some accident,—a not infrequent occurrence. Prof. Croft, for instance, writes us that some years ago he had a collection of moths given to him "collected in or near Toronto," yet among them was a gigantic

Chinese Saturnia! He adds, that on looking into Fischer's work he finds the habitat for the insect is "Eastern Siberia—banks of the Lena."]

[18] 14. *CARABUS LIGATUS*, *Knoch*.—Taken in Canada by Dr. Bigsby. Length of body $7\frac{1}{2}$ lines.

Body black and glossy. Head oblong, impunctured, separated from the neck by a transverse slender curving ridge forming anteriorly a deep sinus; ridge, defending the base of the antennæ, conspicuous; frontal impressions long, not deep; antennæ not much longer than the prothorax: prothorax nearly square, black slightly bronzed: sides lightly punctured, lateral margin reflexed; it is faintly channelled, depressed transversely at the base, with a punctured impression on each side: elytra bronzed, sub-depressed with scarcely any sinus at the apex, lateral margin reflexed and carinated: each elytrum with 13 or 14 rows of impressed punctures; a triple series of oblong discoidal elevations; interstices with numerous transverse linear impressions: abdomen underneath smooth with a few minute punctures on the sides.

The insect here described agrees with Germar's description of Knoch's *C. ligatus*, but it is doubtful whether it be synonymous with *C. carinatus* of DeJean. In most respects, indeed, it accords precisely with his description, but the head is not slightly punctured, as he states his specimens to be.

[Both *C. ligatus* and *C. carinatus* are included as races of *C. vinctus*, Weber, by Le Conte, in his List of Coleoptera, p. 3.]

(To be continued)

MISCELLANEOUS NOTES.

EGGS OF THE CECROPIA MOTH.—I should like to call the attention of the readers of the *Canadian Entomologist* to the fact, that *Platysamia cecropia*, Grote (*Attacus cecropia*, Linn.) always lays two eggs close together upon the food plant of its larva. When seeking for these larvæ early in the season you will usually find them both near to each other, and upon careful examination of the leaves in the vicinity you will find their eggs cemented to the underside, sometimes however upon the upper. They are about .07 long, oval, somewhat flattened on top. They are not as round as *T. polyphemus* or *A. luna*. Colour yellowish white, with a light brown spot on top, and discoloured more or less at the bottom and sides. They are usually laid side by side. The larva gnaws a rough sided hole through the end and is nearly black, growing lighter each moult until of the normal colour. The larva when about to shed its skin deposits in a convenient place sufficient silk to firmly attach its posterior prolegs, and never should be disturbed when in this position, because it depends upon this attachment to draw itself from the old

larva skin. Of six pairs which I tried to raise from the eggs in only one case was I successful, not because they are difficult to rear, for I have had very excellent success heretofore, but I was obliged to trust to inexperienced hands for a short time, and they were not properly fed. This pair are now in the cocoon, and I anticipate that they will come out ♂ and ♀, presuming this to be the law of their nature from the fact of there being two eggs laid together. I hope for further facts the coming season, and that those who have conveniences for raising larvæ will give their attention to the subject.—PHILIP S. SPRAGUE, Boston, Mass.

INSECTS AS FOOD.—In this utilitarian age perhaps the most important question in entomology is to find out in what way insects can be employed for the benefit of mankind. A most curious instance has lately come to my knowledge which I think may interest some of your readers. My informant, M. Guerin-Meneville, a well-known sericulturist and economic entomologist, showed me some dark-coloured cakes resembling somewhat brown bread. These cakes are eaten extensively among the poorer classes and natives in the City of Mexico. They are made exclusively with the eggs of two kinds of water-bugs (*Corixa femorata* and a species of *Notonecta*). The natives cut quantities of reeds and other aquatic weeds, and strew them on the borders of the great lake near the city, and they are soon coated with eggs laid by the insects. These eggs, which are about the size of a mustard-seed, are deposited so abundantly as often to cover the plants entirely. The natives “harvest” these plants, and after exposing them some time in the sun to dry, scrape off the eggs, and either keep them in that state for future use or pound them at once into meal. The perfect insects themselves are not neglected, for they are caught in great numbers and hawked about the streets as food for cage-birds and poultry, which are very fond of them. It is surprising that the raids which are practised against these insects in two of their states do not apparently diminish their numbers; they, however, multiply to such a degree, that notwithstanding the tribute they have to pay, enough survive to supply the natives with food year after year. M. Guerin-Meneville received samples of the insects, the eggs, “seed,” meal, and cakes; but unfortunately the latter accidentally became saturated with spirits of wine in which a snake had been preserved, so that it was impossible to taste them.—*E. L. Ragonot*, 33 Rue de Buffon, Paris (*Science Gossip*).

We hear that the “Ladybirds,” which excited so much curiosity last autumn, have reappeared in large numbers in the neighbourhood of New Wandsworth. So early an appearance will surprise most of us who have been wont to regard these visitors as summer guests.—*Nature*, March 3.

LIST OF COLEOPTERA,

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from page 66.)

PHALACRIDÆ	IPs, <i>Fab.</i>	PELTIS, <i>Kug.</i>
OLIBRUS, <i>Er.</i>	Fasciatus, <i>Oliv.</i>	*Fraterna, <i>Rand.</i>
*Bicolor, <i>Er.</i>	4-Signatus, <i>Say.</i>	4-Lineata, <i>Mels.</i>
*Pallipes, <i>Say.?</i>	*Obtusius, <i>Say.</i>	THYMALUS, <i>Latr.</i>
NITIDULIDÆ	Sanguinolentus, <i>Oliv.</i>	Fulgidus, <i>Er.</i>
CERCUS, <i>Latr.</i>	Confluens, <i>Say.</i>	COLYDIDÆ
*Abdominalis, <i>Er.</i>	Dejeanii, <i>Kirby.</i>	DITOMA, <i>Illig.</i>
BRACHYPTERUS, <i>Kugel.</i>	PITYOPHAGUS, <i>Shuck.</i>	4-Guttata, <i>Say.</i>
Urticæ, <i>Fab.</i>	Bipunctatus, <i>Say.</i>	SYNCHITA, <i>Hellw.</i>
COLASTUS, <i>Er.</i>	RHIZOPHAGUS, <i>Herbst.</i>	*Fuliginosa,
*Semitectus, <i>Say.</i>	*Dimidiatus, <i>Mann.</i>	CICONES, <i>Curtis.</i>
*Unicolor, <i>Say.</i>	*Remotus, <i>Lec.</i>	Marginalis, <i>Mels.</i>
Truncatus, <i>Rand.</i>	MONOTOMIDÆ	COLYDIUM, <i>Fab.</i>
CARPOPHILUS, <i>Leach.</i>	BACTRIDIVM, <i>Lec.</i>	*Lineola, <i>Say.</i>
Niger, <i>Say.</i>	Nanum, <i>Er.</i>	BOTHRIDERES, <i>Er.</i>
Discoideus, <i>Lec.</i>	*Striatum, <i>Lec.</i>	*Geminatus, <i>Say.</i>
CONOTELUS, <i>Er.</i>	MONOTOMA, <i>Herbst.</i>	ENDECTUS, <i>Lec.</i>
*Obscurus, <i>Er.</i>	Parallelum, <i>Lec.</i>	*Hæmatodes, <i>Fab.</i> ²
EPURÆA, <i>Er.</i>	TROGOSITIDÆ	CERYLON, <i>Latr.</i>
*Nigra, <i>Maklin.</i>	ALINDRIA, <i>Er.</i>	Unicolor, <i>Zieg.</i>
Helvola, <i>Er.</i>	Cylindrica, <i>Enc.</i>	Angustulum, <i>Lec.</i>
Boreala, <i>Er.</i>	TROGOSITA, <i>Oliv.</i>	RHYSSODIDÆ
NITIDULA, <i>Fab.</i>	*Corticalis, <i>Mels.</i>	RHYSSODES, <i>Dalm.</i>
Bipustulata, <i>Fab.</i>	*Intermedia, <i>Horn.</i>	*Exaratus, <i>Ill.</i>
OMOSITA, <i>Er.</i>	Dubia, <i>Mels.</i>	CUCUJIDÆ
Colon, <i>Linn.</i>	*Collaris, <i>Sturm.</i>	SYLVANUS, <i>Steph.</i>
PHENOLIA, <i>Er.</i>	Castanea, <i>Mels.</i>	Surinamensis, <i>Linn.</i>
Grossa, <i>Fab.</i>	Laticollis, <i>Horn.</i>	NAUSIBIVS, <i>Redt.</i>
STELIDOTA, <i>Er.</i>	Bimaculata, <i>Mels.</i>	*Dentatus, <i>Mars.</i>
*Octomaculata, <i>Say.</i>	NOSODES, <i>Lec.</i>	CATOGENUS, <i>Westw.</i>
CRYPTARCHA, <i>Shuck.</i>	Silphides, <i>Newm.</i> ¹	Rufus, <i>Fab.</i>
Ampla, <i>Er.</i>		

* Species marked with an asterisk have not before been included in the list of Canadian Coleoptera.

¹ A single specimen picked up on the shore of the Lake, October 1, 1868.

² Under pine bark, May 27th.

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CUCUJUS, <i>Fab.</i>	Flexuosus, <i>Say.</i>	LIMNICHUS, <i>Latr.</i>
Clavipes, <i>Fab.</i>	Pluripunctatus, <i>Lec.</i>	Punctatus, <i>Lec.</i> ⁷
PEDIACUS, <i>Shuck.</i>	*Obsoletus, <i>Mels.</i>	PARNIDÆ.
Planus, <i>Lec.</i>	*Bipustulatus, <i>Mels.</i>	HELICHUS, <i>Er.</i>
*Subglaber, <i>Lec.</i>	TRIPHYLLUS, <i>Latr.</i>	Striatus, <i>Lec.</i>
LÆMOPHLEUS, <i>Lap.</i>	Ruficornis, <i>Lec.</i>	Lithophilus, <i>Germ.</i>
Biguttatus, <i>Say.</i>	LITARGUS, <i>Er.</i>	STENELMIS, <i>Duf.</i>
Fasciatus, <i>Mels.</i>	Sexpunctatus, <i>Say.</i>	Crenatus, <i>Say.</i>
Adustus, <i>Lec.</i>	TYPHLEA, <i>Curtis.</i>	LIMNIUS, <i>Müll.</i>
*Geminatus, <i>Lec.</i>	*Fumata, <i>Linn.</i> ³	*Fastiditus, <i>Lec.</i>
DENDROPHAGUS, <i>Sch.</i>	DIPLOCÆLUS, <i>Guér.</i>	ELMIS, <i>Latr.</i>
Glaber, <i>Lec.</i>	*Brunneus, <i>Lec.</i> ⁴	Vittatus, <i>Mels.</i>
BRONTES, <i>Fab.</i>	DERMESTIDÆ.	HETERO CERIDÆ.
Dubius, <i>Fab.</i>	DERMESTES, <i>Linn.</i>	HETERO CERUS, <i>Fab.</i>
CRYPTOPHAGIDÆ.	Caninus, <i>Germ.</i>	Mollinus, <i>Kies.</i>
ANTHEROPHAGUS, <i>Latr.</i>	Nubilis, <i>Say.</i>	LUCANIDÆ.
Ochraceus, <i>Mels.</i>	Pulcher, <i>Lec.</i> ⁵	LUCANUS, <i>Linn.</i>
TOMARUS, <i>Lec.</i>	Lardarius, <i>Linn.</i>	Dama, <i>Thunb.</i>
*Pulchellus, <i>Lec.</i>	ATTAGENUS, <i>Latr.</i>	Placidus, <i>Say.</i>
PARAMECOSOMA, <i>Curtis.</i>	Megatoma, <i>Fabr.</i>	DORCUS, <i>McL.</i>
Denticulata, <i>Lec.</i>	TROGODERMA, <i>Latr.</i>	Parallelus, <i>Say.</i>
Inconspicua, <i>Lec.</i>	*Ornatum, <i>Say.</i> ⁶	PLATYCERUS, <i>Geoff.</i>
DERODONTIDÆ.	ANTHRENUS, <i>Fab.</i>	Quercus, <i>Weber.</i>
DERODONTUS, <i>Lec.</i>	Varius, <i>Fab.</i>	Depressus, <i>Lec.</i>
Maculatus, <i>Mels.</i>	ORPHILUS, <i>Er.</i>	CERUCHUS, <i>McL.</i>
LATHRIDIIDÆ.	Ater, <i>Er.</i>	Piceus, <i>Weber.</i>
LATHRIDIUS, <i>Ill.</i>	BYRRHIDÆ.	PASSALUS, <i>Fab.</i>
*Pulicarius, <i>Mels.</i>	CYTILUS, <i>Er.</i>	Cornutus, <i>Fab.</i>
*Minutus, <i>Linn.</i>	Varius, <i>Fab.</i>	SCARABÆIDÆ.
CORTICARIA, <i>Mars.</i>	BYRRHUS, <i>Linn.</i>	CANTHON, <i>Hoff.</i>
*Cavicollis, <i>Lec.</i>	Kirbyi, <i>Lec.</i>	Lævis, <i>Drury.</i>
*Pumila, <i>Mels.</i>	Americanus, <i>Lec.</i>	COPRIS, <i>Geoff.</i>
MYCETOPHAGIDÆ.	*Cyclophorus, <i>Kirby.</i>	Anaglypticus, <i>Say.</i>
MYCETOPHAGUS, <i>Hellw.</i>	Geminatus, <i>Lec.</i>	ONTHOPHAGUS, <i>Latr.</i>
Punctatus, <i>Say.</i>		Latebrosus, <i>Fab.</i>

³ Found in scores under rails from which a hay-stack had been removed; January and April.

⁴ In moss on a fallen maple-tree; latter part of July.

⁵ Taken in January under the bark of a dead elm.

⁶ Bred from larvæ found in a case of insects.

⁷ Found under stones at the margin of a creek; in July.

* <i>Canadensis</i> , <i>Fab.</i>	<i>Trox</i> , <i>Fab.</i>	* <i>Villifrons</i> , <i>Lec.</i>
APHODIUS, <i>Ill.</i>	<i>Sordidus</i> , <i>Lec.</i>	PELIDNOTA, <i>McL.</i>
<i>Fimetarius</i> , <i>Linn.</i>	<i>Porcatus</i> , <i>Say.</i>	<i>Punctata</i> , <i>Linn.</i>
* <i>Ruricola</i> , <i>Mels.</i>	<i>Erinaceus</i> , <i>Lec.</i>	COTALPA, <i>Burm.</i>
<i>Granarius</i> , <i>Linn.</i>	<i>Capillaris</i> , <i>Say.</i>	<i>Lanigera</i> , <i>Linn.</i>
<i>Vittatus</i> , <i>Say.</i>	<i>Æqualis</i> , <i>Say.</i>	LIGYRUS, <i>Burm.</i>
<i>Inquinatus</i> , <i>Fab.</i>	HOPLIA, <i>Ill.</i>	<i>Relictus</i> , <i>Say.</i>
* <i>Stereosus</i> , <i>Lec.</i>	<i>Trifasciata</i> , <i>Say.</i>	APHONUS, <i>Lec.</i>
<i>Bicolor</i> , <i>Say.</i>	DICHELONYCHA, <i>Kirby.</i>	* <i>Tridentatus</i> , <i>Say.</i>
* <i>Oblongus</i> , <i>Say.</i>	<i>Elongatula</i> , <i>Schon.</i>	<i>Frater</i> , <i>Lec.</i>
<i>Striatulus</i> , <i>Say.</i>	<i>Albicollis</i> , <i>Burm.</i>	XYLORYCTES, <i>Hope.</i>
EUPARIA, <i>Lep.</i>	SERICA, <i>McL.</i>	<i>Satyus</i> , <i>Fab.</i>
<i>Stereosus</i> , <i>Fab.</i>	<i>Vespertina</i> , <i>Schon.</i>	EURYOMIA, <i>Burm.</i>
* <i>Cognata</i> , <i>Lec.</i>	<i>Sericea</i> , <i>Ill.</i>	<i>Inda</i> , <i>Linn.</i>
ODONTEUS, <i>Klug.</i>	MACRODACTYLUS, <i>Latr.</i>	<i>Fulgida</i> , <i>Fab.</i>
<i>Cornigerus</i> , <i>Mels.</i>	<i>Subspinosus</i> , <i>Fab.</i>	OSMODERMA, <i>Lep.</i>
GEOTRUPES, <i>Latr.</i>	DIPLOTAXIS, <i>Kirby.</i>	<i>Eremicola</i> , <i>Knoch.</i>
<i>Egerici</i> , <i>Germ.</i>	<i>Tristis</i> , <i>Kirby.</i>	<i>Scabra</i> , <i>Beauv.</i>
<i>Excrementi</i> , <i>Say.</i>	LACHNOSTERNA, <i>Hope.</i>	GNORIMUS, <i>Lep.</i>
<i>Splendidus</i> , <i>Fab.</i>	<i>Fusca</i> , <i>Fröhl.</i>	<i>Maculosus</i> , <i>Knoch.</i>
<i>Blackburnii</i> , <i>Fab.</i>	<i>Cognata</i> , <i>Burm.</i>	TRICHIUS, <i>Fab.</i>
NICAGUS, <i>Lec.</i>	* <i>Subtonsa</i> , <i>Lec.</i>	<i>Affinis</i> <i>Gory.</i>
<i>Obscurus</i> , <i>Lec.</i>	* <i>Hirsuta</i> , <i>Knoch.</i>	

EXCHANGES.

SILK MOTHS.—Eggs of *B. Yama-mai*, *Pernyi*, and of the white variety, free from disease, also of *B. mori*, for rare species of Canadian Lepidoptera.—W. V. ANDREWS, Room 17, No. 137 Broadway, New York.

COLEOPTERA.—Species desired from Canada, especially the eastern region; can give in exchange Southern and Californian forms, as well as those from the New England States.—P. S. SPRAGUE, 227 Broadway, South Boston, Mass.

BOOKS RECEIVED.

Hand-book of Zoology, with examples from Canadian Species, Recent and Fossil. By J. W. Dawson. LL.D., F.R.S., &c. Part i.—Invertebrata. With 275 illustrations. Montreal: Dawson Brothers, 1870. Toronto: Adam & Stevenson. We are glad to welcome another addition to the scientific literature of Canada from the pen of Dr. Dawson, Principal of McGill College, the well-known author of *Acadian Geology*, *Archæia*, etc. The little work before us is an elementary treatise on Zoology designed for the use of teachers and isolated students or collectors, and will, we are sure, prove of much value to all beginning the study of the natural history of this country or engaged in the instruction of others. The

copious illustrations from Canadian examples render it particularly useful, as we have generally to resort to British or American publications for scientific information of an elementary character. The work opens with an outline of Physiological Zoology, and an account of Zoological Classification, with divisions into Provinces and Classes based upon the system of Cuvier; the greater part of the volume is occupied with illustrated descriptions of the leading divisions of Radiata, Mollusca and Articulata. In an appendix is given an outline of the classification of Vertebrata, and also valuable instructions for collecting and preserving invertebrate animals. Should the present volume be well received—which we earnestly trust will be the case—the author purposes completing the work by another on the Vertebrata.

The Canada Bookseller: A Quarterly Record of British, American and Native Literature, for the use of the trade and book-buyers: published by Adam, Stevenson & Co., Toronto. March, 1870 (50 cents per annum). We beg to commend to our book-buying and book-loving friends this beautifully printed venture of a most enterprising Canadian firm. It contains much interesting matter relating to the trade, and full information respecting recent or forthcoming publications by Canadian, British and Foreign houses. It is certainly one of the best specimens of typography ever issued in this country.

The American Entomologist. Vol. ii. No. 5. March, 1870. In addition to the usual supply of varied and interesting matter, including several contributed articles, the Editor of this valuable periodical presents us with an admirable steel-plate portrait of his late esteemed coadjutor, Benj. D. Walsh.

Second Annual Report on the Noxious, Beneficial, and other Insects of the State of Missouri. By Charles V. Riley, State Entomologist. Jefferson City: H. Wilcox, 1870. Much of the matter contained in this valuable Report has very naturally appeared already in the pages of the *American Entomologist*, of which the Author is now sole Editor, and is therefore not entirely new to us; it is a great convenience, however, to have the matter thus collected together in moderate compass and in a systematic form, while to those who do not see the Magazine, and who yet are interested in the economic study of insects, the treatise must be invaluable. It is illustrated by about a hundred excellent wood-cuts, and contains accounts of the Chinch Bug, the Army Worms, Tortoise-Beetles, the Pickle Worm, Insects injurious to the grape-vine, the Canker-Worm, Cabbage Worms, etc. The following new species of insects are described and figured in the course of the volume:—Diptera, *Exorista flavicauda*, and *Asilus Missouriensis*; Lepidoptera, *Plusia brassicae*, and *Acronycta populi*.

The Bowdoin Scientific Review. A fortnightly Journal, edited by Professors Brackett & Goodale, Bowdoin College, Brunswick, Maine, and devoted chiefly to Chemistry and Physiology.

Twenty-second Annual Report of the Regents of the University of the State of New York, on the condition of the State Cabinet of Natural History. Albany 1869 (from Mr. J. A. Lintner).—*Proceedings of the Boston Society of Natural History*. Vol. xiii., pages 193 to 224.—*Hardwick's Science Gossip*. No. 63, March, 1870.—*Nature*. Nos. 16 to 21.—*Le Naturaliste Canadien*. Vol.

ii., No. 4.—*The American Naturalist*. Vol. iii., No. 12; Vol. iv., No. 1.—*The Rural New Yorker*.—*The American Agriculturist*.—*The Canada Farmer*.—*The Maine Farmer*.—*The Bunker Hill Aurora*.—*The Oread*.—*Arthur's Home Magazine* and *The Children's Hour*.—*Petites Nouvelles Entomologiques*.

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N.B.—We are now prepared to supply subscribers in Canada and the United States with the above publication at the price named, \$1.20 a year, post free.

Address EDITOR CANADIAN ENTOMOLOGIST, Credit, Ont.

COLEOPTERA FROM THE UPPER AMAZON.—I have a pretty large collection of Coleoptera from the Upper Amazon for sale, in sets of 25 specimens and upwards, including many species seldom found in collections.—JOHN AKHURST, 9½ Prospect Street, Brooklyn, N. Y.

TEXAN INSECTS.—25,000 specimens of Insects from Texas, for sale or exchange (Reference to ED. CAN. ENT.)—G. W. BELFRAGE, Waco, McLennan Co., Texas. Care of Forsgard & Co.

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The Children's Hour (\$1.25), and the *Canadian Entomologist* (\$1), for \$1.75.

The Educator (36 cents), and the *Canadian Entomologist* (\$1), for \$1.05.

Petites Nouvelles Entomologiques (\$1.20), and the *Canadian Entomologist* (\$1) for \$2.

AGENTS FOR THE CANADIAN ENTOMOLOGIST.

CANADA—E. B. Reed, London, Ont.; W. Couper, Naturalist, Ottawa, Ont.; G.

J. Bowles, Quebec, P.Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y.

Green, Newport, Vt.; R. Trestrail & Son, The Bazaar, Dixon, Ill.; W. V. Andrews, Room 17, No. 137 Broadway, New York.

ENGLAND.—Wm. Wesley, 81 Fleet Street, London, E. C. Subscription 5s. per Vol.

FRANCE.—E. Deyrolle, fils, 19 Rue de la Monnaie, Paris. Subscription 8 francs.

The Canadian Entomologist.

VOL. II.

TORONTO, MAY 16, 1870.

No. 7.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 82.)

[Kirby divides the genus *Calosoma* into two sub-genera: *Calosoma* proper having the maxillary palpi with the last joint of the length of the last but one, and the elytra gilded; *Chrysostigma* having the maxillary palpi with the last joint shorter than the last but one, and the elytra obscure with gilded punctiform impressions. The two species that he describes both belong to the latter sub-genus. Dr. Le Conte (Pro. Acad. Nat. Sci. Phil., Feb. 1862, p. 52) has given a more complete classification of the species of this genus into six groups, based upon the differences of the anterior tarsi of the males. Kirby's division has not been adopted by subsequent authors.]

[19] 15. *CALOSOMA CALIDUM*, *Fab.* This species is very common in all parts of North America; several specimens were taken in the expedition.

16. *CALOSOMA FRIGIDUM*, *Kirby*.—Length of the body $9\frac{1}{2}$ lines. Taken in Drummond's Island, Canada, by Dr. Bigsby.

Not unlike *C. calidum*, but longer in proportion and more depressed. Body black, not glossy above. Head confluent punctured and wrinkled: mandibles obliquely but less densely wrinkled, and frontal impressions longer than in *C. calidum*: prothorax scarcely at all bronzed, lateral margin obscurely green, with the same number of elevated lines as in *C. calidum*, but in the furrows formed by them is a series of punctures, and the transverse lines are less conspicuous; there is a triple series of punctiform impressions, but they are bilobed, smaller, and the gilding is greenish and less conspicuous; they are also less numerous, there being only seven or eight in the series next the suture, eight or nine in the intermediate one, and three only towards the apex in the external one: at the base there is also a pair on each side: the sides of the body underneath are greenish, punctured and wrinkled.

[20] 17. *HELOBIA* [*NEBRIA*] *CASTANIPES*, *Kirby*.—Length of body 5 lines. Two specimens were taken in lat. 65° .

Body black, glossy. Antennæ, mouth, mandibles, and palpi pale chesnut or mahogany colour; the former more dilute at the apex; front with three or four slight furrows between the eyes; upper-lip very short: prothorax heart-shaped, constricted posteriorly, convex in the disk; sides and base depressed and lightly punctured: elytra dark piceous, striated or slightly furrowed: furrows very obsoletely punctured; interstices very flat; between the 2nd and 3rd furrows, adjoining the latter, are from three to five shallow but rather large impressions: the legs are slender, of a pale chesnut or mahogany colour, in one of the specimens the thighs are darker than the rest of the leg. *N.B.*—In one specimen there are three and in the other five impressions.

18. *CHLÆNIUS SERICEUS*, *Forst.*—[Say's Ent. Works, ii. 483.]—Several taken in the journey from New York to Cumberland-house. In Canada by Dr. Bigsby. [Very common throughout Canada.]

[21] 19. *CHLÆNIUS IMPUNCTIFRONS*, *Kirby.*—[This name is preoccupied by Say; Kirby's species is probably identical with LeConte's *C. brevilaris*.] Length of body 5-5½ lines.

Smaller than *C. sericeus*, though like it. Head without punctures; antennæ black, with the three first joints testaceous: scutellum not acuminate: elytra black with a shade of green; apex of the epipleuræ or side-covers and legs testaceous; coxæ chesnut. In other respects this agrees with the preceding species.

20. *CHLÆNIUS NEMORALIS*, *Say.*—[Ent. Works, ii. 487.]

A pair taken in the journey from New York to Cumberland-house. [Rare in Canada.]

[22] 21. *CHLÆNIUS QUADRICOLLIS*, *Kirby.*—Length of the body six lines. Taken by Dr. Bigsby in Canada.

Body hairy like the others, black underneath. Head and prothorax bronzed-green; mandibles piceous; palpi and three first joints of the antennæ testaceous; the latter are longer than the thorax, with the 4th joint as long as the 3rd; prothorax rather square, a little narrower before, with the sides curving, sculptured like the preceding species; scutellum sub-acuminate: elytra blue-black, furrowed with deeper furrows very visibly punctured, interstices minutely punctured.

[Placed, with a mark of interrogation, as a synonym of *C. Pennsylvanicus*, Say, in Le Conte's List, p. 11.]

22. *CHLÆNIUS CORDICOLLIS*, *Kirby.*—Length of the body 8 lines. Taken in Canada by Dr. Bigsby.

Body black. Head impunctured; palpi rufous; antennæ dusky, with the three first joints rufous, the third much longer than the fourth: prothorax

obcordate, constricted behind, deeply channelled, disk gibbous on each side of the channel, centre of each gibbosity smooth, remainder of the prothorax punctured; posterior lateral impression longitudinal: elytra black with a shade of green, sculptured as in the preceding species, but the interstices of the furrows are more visibly punctured: legs testaceous, thighs darker.

[23] 23. *CHLÆNIUS EMARGINATUS*, Say.—Length of the body $6\frac{1}{2}$ lines. Taken in the journey from New York to Cumberland-house.

Body hairy, punctured; black underneath. Head glossy green, with a tint of copper between the eyes, and a net-work of very minute, confluent, transverse wrinkles; maxillæ and palpi rufous, maxillary palpi very long; upper-lip transverse, rufo-piceous, anteriorly subemarginate; mandibles piceous; antennæ rufous, longer than the prothorax, with the third joint rather longer than the 4th; prothorax dusky-green, transverse, rather narrowest at the apex, very thick and minutely punctured; basilar impressions double, the inner one the longest: elytra black with a very faint tint of blue: legs rufous.

This is most probably the *C. emarginatus* of Say, but it does not exactly accord with De Jean's species. [Say's *C. emarginatus* belongs to the genus *Anomoglossus*, Chaud.; the species here described is *C. impunctifrons*, Say.]

24. *PLATYNUS ANGUSTICOLLIS*, DeJean.—Length of the body 5 lines. Taken in lat. 54° and 65° . Not uncommon in Britain.

[24] Body very black, glossy, somewhat narrowed. Head smooth, narrower than the prothorax, including the neck sub-rhomboidal, without it triangular; palpi and antennæ piceous; frontal impressions large; prothorax narrower than the elytra, obcordate, longer than wide; dorsal channel deep terminating anteriorly in a transverse obtuse angular impression; lateral margin dilated, especially at the base, reflexed, somewhat piceous in a strong light, basilar impressions single, large, round, with a few scattered indistinct punctures: elytra rather deeply furrowed; furrows very slightly punctured; between the second and third are two punctiform impressions, the anterior one being adjacent to the former furrow, and the posterior to the latter.

[This is considered an erroneous determination by Dr. Le Conte (List, p. 7), and is inserted by him as a race of *P. sinuatus*, Dej.]

25. *AGONUM (ANCHOMENUS) EXTENSICOLLE*, Say —[Ent. Works, ii. 478.] A pair taken in lat. 54° . [Belongs to *Platynus*; has been taken in Ontario.]

26. *AGONUM PICIPENNE*, Kirby.—Length of the body $3\frac{1}{4}$ to 4 lines. Several specimens taken in lat. 54° .

[25] Body black, glossy. Mouth and its organs rufous, except the upper-lip, which is edged with that colour; antennæ longer than the prothorax, piceous with the scape paler than the other joints: prothorax longer than in

the following species, oblong-ovate, with the lateral margin piceous, and not dilated posteriorly as in the majority; basilar impressions rather shallow, oblong: elytra oblong, rufo-piceous, slightly furrowed, furrows impunctured; five punctiform impressions between the second and third; the three anterior ones adjacent to the latter, and the two posterior to the former: legs dusky rufous.

Variety B. With only four punctiform impressions, legs paler.

C. With the 2nd, 3rd and 4th joints of the antennæ piceous, the rest ferruginous: impressions of the elytra as in B.

D. Larger, elytra with five impressions, in other respects like C.

This species appears very like *A. lenum*, Dej., which is also North American, but the colour of the underside of the body and of the head and prothorax is different. [Belongs to *Platynus*.]

27. AGONUM SORDENS, Kirby.—Length of the body three lines. Two specimens taken in lat. 54°.

Body black, glossy. Head rhomboidal; mouth, mandibles at the tip, palpi at the base, and scape of the antennæ, rufous; frontal impressions very slight: prothorax scarcely longer than wide, narrowest behind; dorsal channel rather deep; lateral margin underneath testaceous; basilar impressions oblong, deepish: elytra dusky-testaceous, in one specimen a little bronzed, slightly furrowed, furrows impunctured; between the second and third are five punctiform impressions placed as in the last species: epipleura and legs testaceous.

[26] AGONUM MELANARIUM, De Jean.—Length of the body $4\frac{3}{4}$ lines. Taken in lat. 54°.

Body black, glossy. Mandibles at the tip, mouth and scape of antennæ, piceous: prothorax nearly as long as wide; disk transversely wrinkled; lateral margin at the base much dilated, rather incrassated, and sub-angular; posterior impressions large and distinctly punctured: elytra wider than the prothorax, sub-emarginate at the base, distinctly furrowed with very minute and inconspicuous punctures in the furrows; three punctiform impressions in the third furrow from the suture: legs piceous.

This species is the American representative of *A. versutum*, which it much resembles. [Belongs to *Platynus*; taken at Ottawa by Mr. Billings.]

29. AGONUM SEMINITIDUM, Kirby.—Length of body $4\frac{1}{2}$ lines. Taken in lat. 54°.

Body smooth, glossy, black underneath. Head greenish-bronzed, very glossy, with frontal impressions lunular; antennæ longer than the prothorax; prothorax greenish-bronzed with a copper tint, very glossy, channelled, disk transversely and minutely wrinkled; basilar impressions longitudinal, lateral

margin, particularly at the base, reflexed : elytra black-bronzed, less glossy than the head and prothorax, lightly furrowed ; furrows punctured ; in the interstice between the second and third furrows are five punctiform impressions, two nearer the base and three nearer the apex of the elytrum, so that the interval between the second and third is greater than that between the others.

Variety B. Second and third punctiform impressions not more distant than the others. In this specimen, on the left hand elytrum, there are only four impressions and on the other five, but in neither are the second and third situated as in A. It may be a distinct species, but I can discover no other difference.

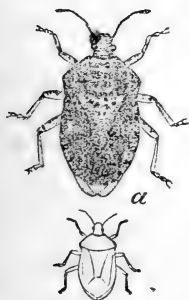
[27] 30. AGONUM SIMILE, Kirby.—Length of the body $3\frac{1}{2}$ lines. Locality not stated.

Body glossy, underneath very black, above black slightly bronzed. Antennæ scarcely longer than the prothorax : prothorax rather longer than broad ; basilar impressions roundish, impunctured : elytra more bronzed than the head and prothorax, lightly furrowed ; furrow adjoining the suture more depressed and deeper than the rest ; in the space between the second and third furrows are five equi-distant punctiform impressions, the two anterior adjoining the latter furrow, and the three posterior the former.

This little species greatly resembles *A. seminitidum*. It is however much smaller, less bronzed, the prothorax is longer in proportion, the sutural furrow is deeper, and the impressions are differently arranged.

AN INSECT FRIEND.

Arma placidum, Ulke.



The accompanying figure correctly represents the mature form of the friendly bug referred to in the "Canadian Entomologist," Vol. ii. No. 2, which was found feasting so energetically on the larvæ of the gooseberry saw fly (*Nematus ventricosus*). For a description of the appearance and habits of the immature form of this beneficial insect the reader is referred to the above number of the "Canadian Entomologist."

The perfect insect has been determined by Mr. Ulke, of Baltimore, Md., who found it to be an undescribed species of *Arma*, to which he has given the specific name *placidum*. Hence our friend will in future be known as *Arma placidum*, Ulke.

The excellent drawing of the insect is the work of our esteemed and able friend C. V. Riley, Esq., State Entomologist of Missouri, who has kindly

furnished us with an electrotype of the plate for the use of this journal. The smaller figure is the natural size of the bug, the larger one a magnified representation of the same.

W. SAUNDERS, London, Ont.

HINTS ON DESCRIBING CATERPILLARS.

BY W. SAUNDERS, LONDON, ONT.

When comparing descriptions of larvæ made by different writers, the labor of the student is often greatly increased by the want of order and method in their compilation. With a view of simplifying details and lessening labor, the following suggestions are offered, with the hope that they may serve to stimulate some to enter earnestly into this interesting branch of our favorite study.

When we take up a caterpillar with the intention of describing it, the many ornamentations, markings and diversities of color belonging to it, are sometimes quite confusing, unless we begin to classify them, when the most complex appearance is soon markedly simplified. We have for some time past made it a rule to take descriptions precisely in the following manner and order. First, the full *length* of body when in motion; then *form*, whether cylindrical, onisciform, or otherwise; if strongly annulated or ringed, a note is made of that also.

Beginning with the *head*, which we call the first segment—making the total number thirteen—take first its size, large, medium, or small. Next form, flattened, rounded, or pointed, and whether strongly bilobed or not. Then color, markings and appendages, such as spines or hairs; giving also the color of mandibles.

Commencing the body with the upper surface, give first its general color; next markings, such as stripes, lines or spots, working from anterior to posterior segments; then ornamentations or appendages, such as hairs, spines, horns, tubercles or granulations, with their size, form and color.

Under surface—first general color, then markings, &c., finishing with color and form of feet and prolegs.

By steadily observing a particular arrangement of this sort, descriptions may readily be compared with one another and their identity or distinctness established with little labor.

It is also an excellent plan to underline some of the most prominent and striking features in the appearance of a larva, by which one may often at a glance decide whether it is likely that a certain caterpillar before you is or is not identical with a particular description. In Stainton's "Manual of Butterflies and Moths" this plan is carried out, and the prominent characteristics thus given in a few italicised words will frequently relieve one of the labor of reading a description throughout.

LIST OF LEPIDOPTERA TAKEN AT QUEBEC.

BY G. J. BOWLES.

- | | | |
|---|--|---|
| PAPILIONIDÆ. | | 21. <i>Pyrameis atalanta</i> , Linn. (rare) |
| 1. <i>Papilio turnus</i> , Linn. | | 22. <i>cardui</i> , Linn. |
| PIERIDÆ. | | 23. <i>Huntera</i> , Sm. |
| 2. <i>Pieris oleracea</i> , Harr. (rare). | | 24. <i>Limenitis arthemis</i> , Drur. |
| 3. <i>rapæ</i> , Linn. | | SATYRIDÆ. |
| 4. <i>Colias philodice</i> , Godt. | | 25. <i>Chionobas jutta</i> , Moschler, (C. |
| 5. <i>eurytheme</i> (<i>Chrysotheme</i> ?) | | <i>Balder</i> , Boisd. & Lec.) |
| <i>Boisd</i> (very rare). | | 26. <i>Neonympha Boisduvallii</i> , Harr. |
| DANAIDÆ. | | 27. <i>Erebia nephele</i> , Kirby. |
| 6. <i>Danaïs archippus</i> , Fab. (rare). | | 28. <i>Satyrus alope</i> , (?) Fab. |
| NYMPHALIDÆ. | | LYCÆNIDÆ. |
| 7. <i>Argynnis cybele</i> , Godt. | | 29. <i>Thecla Augustus</i> , Kirby. |
| 8. <i>myrina</i> , Cram. | | 30. <i>clothilde</i> , Edwards. |
| 9. <i>belliona</i> , Godt. (very | | 31. <i>Polyommatus Americana</i> , D' Urb. |
| rare). | | 32. <i>epixanthe</i> , Boisd. & |
| 10. <i>aphrodite</i> , Godt. | | <i>Lec.</i> |
| 11. <i>Melitæa phæton</i> , Cram. (rare) | | 33. <i>lucia</i> , Kirby. |
| 12. <i>Harrisii</i> , Scudder. | | HESPERIDÆ. |
| 13. <i>tharos</i> , Cram. | | 34. <i>Eudamus tityrus</i> , Smith (v. rare). |
| 14. <i>Grapta interrogationis</i> , Godt. | | 35. <i>bathyllus</i> , Smith. |
| (very rare.) | | 36. <i>Nisoniades brizo</i> , Boisd. & Lec. |
| 15. <i>comma</i> , Harr. | | 37. <i>catullus</i> , Smith. |
| 16. <i>faunus</i> , Edwards. | | 38. <i>Hesperia mystic</i> , Edwards. |
| 17. <i>Vanessa J-album</i> , Boisd. & Lec. | | 39. <i>hobomok</i> , Harr. |
| 18. <i>Milberti</i> , Encyc. | | 40. <i>wamsutta</i> , Harr. |
| 19. <i>progne</i> , Cram. | | 41. <i>ahaton</i> , Harr. |
| 20. <i>antiopa</i> , Linn. | | 42. <i>mandan</i> , Edwards. |

NOTES.

I have followed the authorities given in the Society's list. *Papilio asterias* is common one hundred and fifty miles east and west of Quebec. *Pieris oleracea* is subject to great variation. I have seen specimens with the nervures on the under side as fully covered with greyish scales as *P. napi* of Europe, and others with secondaries of a greenish tinge underneath. *Argynnis Atlantis* has been taken fifty miles west of the city, and on the lower St. Lawrence. Quebec is the only known locality for *Chionobas jutta* in Canada. I retain the two species, *Erebia nephele* and *Sityrus alope*, though some of our best entomologists consider them to be identical. I have never seen a Quebec specimen with the band on the fore wings of a yellow colour. Those

that I have (hesitatingly) labelled *S. alope* have a perceptible band of a brown colour, a shade lighter than the rest of the wing,—those labelled *E. nephele* have no trace of a band. There is certainly a great contrast between the coloration of the latter and the *S. alope* I have received from other localities. Several species will no doubt be added to the Hesperidæ, as those found about Quebec have not been properly studied as yet.

NOTES ON SOME OF THE COMMON SPECIES OF CARABIDÆ, FOUND IN TEMPERATE NORTH AMERICA.

BY PHILIP S. SPRAGUE, BOSTON, MASS.

ARTICLE NO. III.

Harpalus herbivagus, Say. Long. .37 in. (30 to 40).

Oblong-oval, piceous; legs, mouth, antennæ and sides of prothorax, rufo-testaceous. Head black, shining, rather large; antennæ short, scarcely reaching the base of thorax, the latter nearly twice broader than long, basal angles broadly rounded, sides scarcely depressed at the apical angle, very much so behind, the margin narrowly reflexed, basal foveæ shallow scarcely punctured. Elytra ♂ black shining, ♀ semi-opaque and distinctly reticulate, striæ not deep, interstices somewhat convex, with a dorsal puncture behind the middle near the second stria, apex slightly and obliquely sinuate with a small but distinct sutural spine in the ♀; beneath rufo-piceous.

In this species the ♂ is decidedly smaller than the ♀, and the reticulations of the elytra are so fine as to be nearly obsolete, the basal foveæ of the prothorax in some specimens are well defined with a few distinct punctures, but they are usually broad, shallow and smooth, the basal angles above are much flattened and at the margin strongly rounded; in this respect resembling *H. amputatus*. The thorax in some specimens very closely resembles that of *H. opacipennis* in outline, but the latter is more narrowed in front and with the sides not or scarcely depressed, and the elytra of both sexes are reticulate and semi-opaque.

H. foveicollis, Lec., and *H. proximus*, Lec., are varieties. Examples of these are sometimes found in a small series, which make them appear quite distinct, but with larger numbers these differences insensibly merge into the common general form of *herbivagus*. The epipleura in immature specimens are sometimes ferruginous, and in this respect resembling *H. pleuriticus*.

Harpalus pleuriticus, Kirby. Long. .35 inch.

Oval rufo-piceous, shining; legs, mouth, antennæ and epipleura rufo-testaceous. This beetle resembles in size and general characters the preceding, but differs by being lighter colored, more robust (convex); both ♂ ♀ are smooth, shining above, with the reticulation of the elytra nearly obsolete, the

thorax behind the middle is subparallel, not broadly rounded, as in *H. herbivagus*, the basal angles nearly right-angles, with only the extreme apex slightly rounded, the sides are feebly depressed, the basal foveæ are well defined and with the margin and basal angles strongly and almost confluent punctured, the elytral striæ are deep and the interstices convex, epipleura ferruginous or testaceous.

Harpalus fallax, Lec. Long. .38 inch.

Oval, black piceous; legs, mouth, antennæ and side margins of prothorax rufo-testaceous. Head and disk of thorax rufo-piceous, the latter at the sides rounded and depressed behind; basal foveæ not very deep with a few fine and scattered punctures: elytra in both sexes shining, deeply striate and the interstices quite convex; epipleura black, *never* testaceous. This beetle is very closely allied to the two preceding, partaking of the characters of both; it is larger than *pleuriticus*, and more robust, but about the size of the ♀ *herbivagus*; the elytra in both sexes are smooth and shining, the thorax is more rounded at the sides than in *pleuriticus* but less so than in *herbivagus*.

If three series of these beetles be arranged side by side we shall have

H. pleuriticus, smallest, reddish-brown, convex.

H. herbivagus, ♂ small, black shining; ♀ larger, black, elytra semi-opaque and reticulate.

H. fallax larger, more convex, elytra in both sexes black, shining.

The following table will further assist in determining these closely allied species.

Black piceous, thorax at sides and basal angles strongly rounded, basal foveæ shallow, scarcely punctured, elytra ♂ smooth, shining; ♀ reticulate, semi-opaque, striæ shallow *herbivagus*.

Rufo-piceous, robust, thorax at sides scarcely rounded or depressed, basal foveæ sufficiently deep with the angles and side margins strongly punctured; elytra reddish-brown, ♂ ♀ shining, striæ deeper, epipleura usually testaceous..... *pleuriticus*.

Piceous, more robust, thorax at the sides depressed and with the basal angles more rounded, basal foveæ and angles less punctured; elytra ♂ ♀ shining, striæ deep, interstices quite convex, epipleura black, *never* testaceous. *fallax*.

Harpalus opacipennis, Hald. Mass. Long. .30 inch.

Elliptical, black opaque; mouth and antennæ testaceous; legs rufo-testaceous. Thorax narrowed in front, sides slightly rounded, scarcely depressed, basal angles nearly rectangular, somewhat rounded, basal foveæ distinct, linear, impunctured, sometimes rugose. Elytra reticulate and opaque in both sexes, striæ fine with a dorsal puncture as in the preceding. This beetle

differs from the others by its smaller size, by having the thorax narrowed forward, and with the elytra giving it a more elliptical form, and by the elytra in both sexes being reticulate and opaque.

Harpalus nitidulus, Chand. Mo. Common. Long. .20, .28 in.

Elliptical, rufo-piceous shining; legs, mouth and antennæ testaceous. Head and thorax perfectly smooth, the latter narrowed in front, sides and basal angles rounded, sides not depressed, basal foveæ nearly obsolete, not punctured. Elytra smooth and shining in both sexes, striæ not deep, interstices somewhat flattened, with a dorsal puncture as usual. This is our smallest species of the true genus *Harpalus*.

GALLS FOUND ON PLANTS OF THE GENUS RUBUS.

BY H. F. BASSETT, WATERBURY, CONN.

I think the gall described in the last number of the *Entomologist*, by Mr. Wm. Couper, as found on the roots of the raspberry, has never been noticed before. I have in my collection a species of gall fly, hitherto undescribed, belonging to the genus *Diastrophus*, which I reared in great numbers from galls found on the roots of *Rubus villosus*, the common blackberry, these galls were polythalamous however, and are undoubtedly distinct from his species.

Mr. Couper says his galls are from the roots of the common raspberry. Does he mean the *Rubus strigosus*, so common in northern New England, or *Rubus occidentalis*, which is the most common species in northern Ohio? or does he refer to some other species? I shall be glad to learn the species and also to receive specimens of the galls and gall insects, as I have made the Hymenopterous gall-flies a special study for several years, and I have several species from this same genus of plants, some of which are undescribed. The only *monothalamous* species yet described as occurring on plants of the genus *Rubus*, is *Diastrophus cuscuteformis*, O. S. *Diastrophus potentillae*, Bassett, is found on a plant belonging to the same order (*Genus Potentilla Canadensis*) and is *monothalamous*. It is developed from the axillary buds of the stems.

I submit for publication a description of the Blackberry root gall and gall fly,—*Diastrophus radicum*, N. Sp.

Galls. On the roots of *Rubus villosus*, of very irregular shape, and varying in size from those of the shape and size of a pea to those two inches or more in length, and nearly an inch in diameter, and containing few or many larvæ according to size. The galls are occasionally found on the part of the stalks of the blackberry which is below the surface.

Insect, ♀. Head black, smooth, ocelli small, face black, hairy, the hairs close and converging towards the mouth; Antennæ 13 jointed, joints short,

distinct, hairy, and all of nearly equal length, color dull brownish yellow; *Mesothorax* black, shining, smooth, parapsidal grooves not deep, the two short median lines very obscure, a short faint line over the base of each anterior wing; *Scutellum* black, deeply and somewhat regularly grooved and ridged, foveæ large shallow and finely rugose; *Abdomen* black, smooth, ventral sheath clear, shining, brown; *Wings* of a dusky hue, veins dark red, areolet large, distinct, radial area open, but the second transverse vein extends along the margin of the wing one third of the length of the area and the radial vein is thickened at the margin of the wing and in most specimens throws back a very short branch along the margin of the radial area, showing a tendency towards a closed radial area. *Legs* a clear dark amber with base of trochanters and middle of femora and tibiæ shining, brown. Length, dry specimens, .11.

♂, smaller, 14-jointed antennæ, third joint deeply incised, color of antennæ and legs slightly darker than ♀. Length, .09.

I have numerous specimens ♂ and ♀ though the ♀♀ are far more numerous than the ♂♂. This species is remarkably distinct from the three species of *N. Am. Diastrophus* hitherto described, and in the darker veins and the partially closed radial area from the species described below.

Looking over my collection of galls, I find a gall from the stalk of *Rubus strigosus* and several gall insects reared from the same. The gall is an inch long, and three-fourths of an inch thick—an abrupt swelling involving the whole circumference of the stalk. Quite a large number of insects seem to have escaped from it, though many of them were parasites, I have only five specimens of the true gall-fly, and these are all females. The description is as follows:—

Diastrophus turdigus, N. Sp. ♀. *Head*, black, shining; *Antennæ*, reddish brown, 13 jointed, joints of nearly equal length, but longer, less hairy and less distinctly annulose than in *D. radicum*. Upper part of the *face* rough, lower with fine grooves, converging to the mouth; *Mesothorax*, smooth, black and shining, parapsidal grooves narrow, intermedial lines very short, and only seen in a favorable light. A faint linear depression over the base of the anterior wings. *Scutellum*, finely wrinkled, foveæ deep, smooth; *Pleura* finely striate; *Abdomen*, black, smooth, but the ventral sheath reddish brown; *Wings*, dusky, veins distinct, but not heavy, areolet very small and in some individuals obsolete, radial area open—the radial vein stops short of the margin of the wing—cubital vein slender, reaching to the first transverse; second transverse spreads out at the base of the radial area into a dark reddish brown cloud; *Legs*, dark amber, changing in the trochanters and middle of the femora and tibiæ, to a clear dark brown. Length, dry specimens, .12. Five ♀♀, no ♂♂.

I have a male gall fly, reared from a similar gall, found this spring on the cultivated red raspberry. I could not learn the variety of the raspberry. It would be strange if it should prove an introduced variety—for the fly seems to be identical with *D. turgidus*—the only difference I can see, besides the sexual, is that the legs are darker. The antennæ are 14 jointed, the third joint deeply incised.

As I have several galls from this variety of raspberry, and shall probably rear both male and female flies, I shall have an opportunity to compare the females reared from the wild and cultivated raspberry, and shall then be able to decide the question of their identity.

My raspberry galls and also several species of oak galls in my collection, are much pecked by birds. With the countless tribes of parasitic insects, and the birds that prey upon them, it is a wonder the whole family of gall makers does not become extinct.

MISCELLANEOUS NOTES.

COCOON OF THE CECROPIA.—In the last number of the *Amer. Ent. & Bot.* mention is made of kernels of corn being found in the cocoon of the *Cecropia*. Two similar instances have come under my notice. Twice I have found beech-nuts in the inside of the cocoon at the small end, between the caterpillar and the innermost layer of silk. The explanation offered by Mr. LeBaron seems hardly admissible under these circumstances. On the other hand, the fact of no beech trees being within an eighth of a mile would indicate that they must have been placed there by the blue-jays or some other bird as he supposes.—C. S. MINOT, Boston, Mass.

FOOD PLANTS OF C. PROMETHEA.—The following list is compiled from actual observation and various authorities :—Barberry, birch, cherry, maple, sassafras, azalea, oaks, sometimes arbor vitæ and pine, apple, peach, plum, syringa, silver bell, beech.—C. S. MINOT, Boston, Mass.

HOW TO PRESERVE SPIDERS.—From Thorell's *Essays on European Spiders* ('*Nova Acta regię Societatis Scientiarum Upsaliensis*,' ser. III. vol. vii. fasc. I, 1869), we extract the following observations, first suggested by M. Westring, a Swedish naturalist, on the best mode of preserving spiders in Natural History collections. The essential feature of the method is that the spider's *abdomen*, and that part only of its body, is *hardened by heat*. The spider is first killed, either by the vapour of ether or by heat, and is impaled by an insect pin, which is passed through the right side of the cephalo-thorax; the abdomen is then cut off close to the cephalo-thorax, and the cut surface dried with blotting-paper. The head of another insect pin is cut off, and the blunt

extremity introduced through the incision into the abdomen, up to the spinners. The abdomen thus spitted is inserted into a large test-tube held over the flame of a candle, the preparation being constantly rotated till dry, avoiding the extremes of too much or too little heat—the firmness of the abdomen being tested every now and then with a fine needle, till it is so firm as not to yield to pressure; the front extremity of the pin is now cut off obliquely, and the point thus made inserted into the cephalo-thorax, the two halves of the body being thus again brought into apposition. The animal may then be mounted as usual. This method is stated by Mr. Thorell to preserve the appearance of the animals almost entirely unchanged.—*Nature*.

MUMMIED BEETLES.—In the year 1835 the late Professor Audouin exhibited before the (French) Entomological Society a vase of red clay, resembling an orange in size and form, with a short neck, which had been taken from an ancient tomb at Luxor (the Egyptian Thebes). There was a slight fracture where the neck joined the body, and, on examination, the vase was found to be filled with a black lumpy matter, consisting entirely of the bodies of a small ptinoid beetle (*Gibbium Scotias*). The mass was quite compact, so that the number of beetles must have reached several thousands. How are we to explain the presence of such an enormous quantity of individuals of this species in a vase, into which they could not have themselves penetrated, because, previously to the fracture occurring, it was hermetically sealed? It is a problem which it is not easy to solve. M. Brullé, who quotes the story in his "*Histoire des Coléoptères*," believes without doubt that the circumstance is connected with some superstitious usage of the ancient Egyptians. We leave to archæologists the task of appraising this theory at its proper value, which, if it be well founded, will go far to settle the difficulty.—(*Duponchel*, "*Dict. d'Hist. Nat.*") *Science Gossip*.

SPIDERS AND LARVÆ.—In the April part of *Science Gossip* is a query with the above heading, which I can answer in the affirmative. If Mr. Roberts wishes to see a spider thoroughly puzzled, let him put a leaf-rolling caterpillar into its web; the spider (provided the larva be proportionate to its own size) seizes it fearlessly and winds it up; but as fast as he winds, so fast does the larva slip out of its bonds, until it either escapes from the web altogether or gets weakened by the repeated bites of its adversary. The larva of a *Noctua* also astonishes a spider, from the fact that it cannot be made to lie still in the web, though wrapped in ever so many grave-clothes; when the spider has given it two or three bites, however, its activity decreases, when the spider sucks its juices at pleasure. The larvæ of certain species of *Lepidoptera* and *Hymenoptera* are distasteful to spiders, as I observed in a short paper read before the Entomological Society in March, 1869.—*A. G. Britten*, *British Museum (Science Gossip)*.

LIST OF COLEOPTERA,

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from page 86.)

BUPRESTIDÆ.		
CHALCOPHORA, <i>Sol.</i>	AGRILUS, <i>Sol.</i>	HYLOCHARES, <i>Latr.</i>
* <i>Lacustris</i> , <i>Lec.</i> ¹	<i>Arcuatus</i> , <i>Say.</i>	* <i>Nigricornis</i> , <i>Say.</i>
<i>Virginienis</i> , <i>Drury.</i>	<i>Ruficollis</i> , <i>Fab.</i>	MICRORHAGUS, <i>Esch.</i>
<i>Campestris</i> , <i>Say.</i>	* <i>Obliquus</i> , <i>Lec.</i>	* <i>Imperfectus</i> , <i>Lec.</i>
DICERCA, <i>Esch.</i>	<i>Otiosus</i> , <i>Say.</i>	* <i>Humeralis</i> , <i>Lec.</i>
<i>Divaricata</i> , <i>Say.</i>	<i>Bilineatus</i> , <i>Web.</i>	* <i>Rufolus</i> , <i>Lec.</i>
<i>Lurida</i> , <i>Fab.</i>	* <i>Subcinctus</i> , <i>Gory.</i>	ADELOCERA, <i>Latr.</i>
<i>Spretia</i> , <i>Lap.</i>	<i>Plumbeus</i> , <i>Lec.</i>	<i>Impressicollis</i> , <i>Say.</i>
* <i>Asperata</i> , <i>Lap.</i>	<i>Politus</i> , <i>Say.</i>	<i>Pennata</i> , <i>Fab.</i>
<i>Tenebrosa</i> , <i>Kirby.</i>	* <i>Puncticeps</i> , <i>Lec.</i>	<i>Aurorata</i> , <i>Say.</i>
* <i>Chrysea</i> , <i>Mels.</i>	* <i>Lacustris</i> , <i>Lec.</i>	<i>Marmorata</i> , <i>Fab.</i>
* <i>Punctulata</i> , <i>Schönh.</i>	TAPHROCERUS, <i>Sol.</i>	* <i>Maculata</i> , <i>Lec.</i>
* <i>Manca</i> , <i>Lec.</i>	<i>Gracilis</i> , <i>Say.</i>	ALBUS, <i>Esch.</i>
ANCYLOCHIRA, <i>Esch.</i>	BRACHYS, <i>Sol.</i>	<i>Oculatus</i> , <i>Linn.</i>
<i>Fasciata</i> , <i>Fab.</i>	<i>Ovata</i> , <i>Weber.</i>	* <i>Myops</i> , <i>Fab.</i>
<i>Maculiventris</i> , <i>Say.</i>	<i>Terminans</i> , <i>Fab.</i>	CARDIOPHORUS, <i>Esch.</i>
<i>Striata</i> , <i>Fab.</i>	* <i>Æruginosa</i> , <i>Gory.</i>	<i>Amictus</i> , <i>Mels.</i>
CINYRA, <i>Lap.</i>	THROSCIDÆ.	CRYPTOHYPNUS, <i>Esch.</i>
* <i>Gracilipes</i> , <i>Mels.</i>	THROSCUS, <i>Latr.</i>	<i>Abbreviatus</i> , <i>Say.</i>
MELANOPHILA, <i>Esch.</i>	<i>Constrictor</i> , <i>Say.</i>	* <i>Pectoralis</i> , <i>Say.</i> ²
<i>Longipes</i> , <i>Say.</i>	* <i>Punctatus</i> , <i>Bonv.</i>	ELATER, <i>Linn.</i>
<i>Fulvoguttata</i> , <i>Harris.</i>	DRAPETES, <i>Redt.</i>	<i>Nigricollis</i> , <i>Germ.</i>
ANTHAXIA, <i>Esch.</i>	<i>Extriatus</i> , <i>Say.</i>	<i>Linteus</i> , <i>Say.</i>
* <i>Cyanella</i> , <i>Gory.</i>	ELATERIDÆ.	* <i>Discoideus</i> , <i>Germ.</i>
<i>Subaenea</i> , <i>Lec.</i>	THAROPS, <i>Lap.</i>	* <i>Semi-cinctus</i> , <i>Rand.</i>
* <i>Viridifrons</i> , <i>Say.</i>	* <i>Obliquus</i> , <i>Say.</i>	<i>Vitosus</i> , <i>Lec.</i>
CHRYSOBOTHRIS, <i>Esch.</i>	EUCNEMIS, <i>Ahrens.</i>	<i>Apicatus</i> , <i>Say.</i>
<i>Femorata</i> , <i>Fab.</i>	<i>Amœnicornis</i> , <i>Say.</i>	<i>Phœnicopterus</i> , <i>Germ.</i>
<i>Quadriimpressa</i> , <i>Lap.</i>	FORNAX, <i>Lap.</i>	* <i>Xanthomus</i> , <i>Germ.</i>
<i>Dentipes</i> , <i>Germ.</i>	* <i>Orchesides</i> , <i>Newm.</i>	<i>Luctuosus</i> , <i>Lec.</i>
	<i>Cylindricollis</i> , <i>Say.</i>	<i>Socer</i> , <i>Lec.</i>
	<i>Calceatus</i> , <i>Say.</i>	<i>Impolitus</i> , <i>Mels.</i>

* Species marked with an asterisk have not before been included in the list of Canadian Coleoptera.

¹ A single specimen taken by Dr. Milward.

² Taken at the margin of the creek.

ELATER, <i>Linn. (contin.)</i>	MELANOTUS, <i>Esch.</i>	SERICOSOMUS, <i>Esch.</i>
*Manipularis, <i>Cand.</i>	*Cuneatus, <i>Lec.</i>	*Fusiformis, <i>Lec.</i>
Fuscatus, <i>Mels.</i>	Scrobicollis, <i>Lec.</i>	Silaceus, <i>Say.</i>
Pedalis, <i>Germ.</i>	*Castanipes, <i>Payk.</i>	OXYGONUS, <i>Lec.</i>
Rubricus, <i>Say.</i>	Communis, <i>Gyll.</i>	Obesus, <i>Say.</i>
Obliquus, <i>Say.</i>	*Pertinax, <i>Say.</i>	CORYMBITES, <i>Latr.</i>
Protervus, <i>Lec.</i>	LIMONIUS, <i>Esch.</i>	Hamatus, <i>Say.</i>
DRASTERIUS, <i>Esch.</i>	Aurifer, <i>Lec.</i>	Triundulatus, <i>Rand.</i>
Dorsalis, <i>Say.</i>	Confusus, <i>Lec.</i>	*Furcifer, <i>Lec.</i>
Amabilis, <i>Lec.</i>	Plebejus, <i>Lec.</i>	Hieroglyphicus, <i>Say.</i>
MONOCREPIDIUS, <i>Esch.</i>	*Quercinus, <i>Say.</i>	Splendens, <i>Zieg.</i>
Auritus, <i>Herbst.</i>	CAMPYLUS, <i>Fisch.</i>	Inflatus, <i>Say.</i>
LUDIUS, <i>Latr.</i>	Denticornis, <i>Kirby.</i>	Rotundicollis, <i>Say.</i>
Abruptus, <i>Say.</i>	PITYOBIUS, <i>Lec.</i>	Sulcicollis, <i>Say.</i>
AGRIOTES, <i>Esch.</i>	*Anguinus, <i>Lec.</i> ³	Cylindriciformis, <i>Herbst.</i>
Mancus, <i>Say.</i>	ATHOUS, <i>Esch.</i>	Spinosus, <i>Lec.</i>
*Pubescens, <i>Mels.</i>	Brightwelli, <i>Kirby.</i>	Pyrros, <i>Herbst.</i>
Fucosus, <i>Lec.</i>	Acanthus, <i>Say.</i>	Falsificus, <i>Lec.</i>
Stabilis, <i>Lec.</i>	*Maculicollis, <i>Lec.</i>	*Athoides, <i>Lec.</i>
DOLOPIUS, <i>Esch.</i>	Cucullatus, <i>Say.</i>	*Tessellatus, <i>Linn.</i>
Pauper, <i>Lec.</i>	Scapularis, <i>Say.</i>	ASAPHES, <i>Kirby.</i>
		Memnonius, <i>Herbst.</i>
		Melanophthalmus, <i>Mels.</i>

—♦—

EXCHANGES.

STAPHYLINIDÆ.—I have for some years been engaged upon exotic *Staphylinidæ* and have already a numerous collection of American species of this family of Coleoptera. Desiring to increase it as much as possible I should like to enter into correspondence with a collector in North America for the exchange or purchase of these insects. I would give in exchange either European Coleoptera or exotic Staphylinidæ; if necessary I would pay so much a hundred or named specimen, as desired. Having already published descriptions of several new American species, especially from Chili and Mexico, I venture to hope that I may obtain one or more correspondents in North America.—ALFRED FAUVEL, Bibliothécaire, Société Linnéenne de Normandie, 16 Rue d' Auge, Caen, France.

SILK MOTHS.—Eggs of *B. Yama-mai*, *Pernyi*, and of the white variety, free from disease, also of *B. mori*, for rare species of Canadian Lepidoptera.—W. V. ANDREWS, Room 17, No. 137 Broadway, New York.

³ A specimen of this rare insect was taken on the Lake shore, July 17th.

COLEOPTERA.—Species desired from Canada, especially the eastern region ; can give in exchange Southern and Californian forms, as well as those from the New England States.—P. S. SPRAGUE, 227 Broadway, South Boston, Mass.

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AGENTS FOR THE CANADIAN ENTOMOLOGIST.

CANADA—E. B. Reed, London, Ont. ; W. Couper, Naturalist, Ottawa, Ont. ; G. J. Bowles, Quebec, P.Q. ; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass. ; J. Y. Green, Newport, Vt. ; R. Trestrail & Son, The Bazaar, Dixon, Ill. ; W. V. Andrews, Room 17, No. 137 Broadway, New York.

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The Canadian Entomologist.

VOL. II.

TORONTO, JULY 1, 1870.

No. 8.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 93.)

31. AGONUM AFFINE, *Kirby*. — Length of body 4 lines. Locality not stated. A single specimen taken.

Body very black, glossy. Antennæ longer than the prothorax: prothorax of the same width before as behind, so as to appear more square than in the preceding species; its lateral margin at the base is likewise not reflexed, the dorsal channel is slight, and the disk is minutely and transversely wrinkled; the basilar impressions are deep, large and circular; elytra very slightly bronzed; three punctiform impressions, the anterior one adjoining the third furrow, and the two posterior the second, are visible in the usual situation; the four anterior trochanters are of a deep red.

[28] 32. AGONUM ERYTHROPUM, *Kirby*. Length of body $4\frac{1}{2}$ lines. Taken in Canada by Dr. Bigsby.

Body glossy, black underneath, above bronzed. Antennæ black, with the scape dusky rufous; prothorax tinted with copper, obcordate, with rounded angles; basilar impressions round and deep; elytra tinted with copper, with three nearly obsolete punctiform impressions in the usual situation; legs dusky rufous; in other respects it resembles *A. seminitidum*.

This species appears to be the American representative of *A. parumpunctatum*. It is, however, larger, more bronzed, the impressions are less distinct and more distant, and the thighs as well as the tibiæ and tarsi are rufous.

[The name of this species is pre-occupied by Dejean's *P. erythropus*; it is placed with a mark of interrogation in Dr. LeConte's list under *Platynus subcordatus*, Lec.]

33. AGONUM CUPRIPENNE, *Say*. Plate I. fig. 4. — Many specimens of this lovely *Agonum* were taken in lat. 54° . It appears to be very common in North America, where it represents *A. sexpunctatum*, the most brilliant

of our European species, but which *A. cupripenne* far exceeds in beauty. [Quite common in Western Canada.]

[29] 34. *CALATHUS GREGARIUS*, Say. — Taken frequently in lat. 54°. [Say, Ent. Works, ii. p. 472. Taken in both Ontario and Quebec.]

35. *PLATYDERUS NITIDUS*, Kirby. Plate I. fig. 5. — Length of body 4 lines. Three specimens, all females, taken in lat. 54°.

Body black, glossy; head triangular; mouth piceous; antennæ rather longer than the prothorax, piceous with the terminating joints paler, scape rufous; prothorax subquadrangular, with the posterior angles rounded, emarginate at the base as well as at the apex, slightly channelled, with a pair of linear basilar impressions on each side, the external one being oblique and the other longitudinal; elytra rather deeply furrowed, with two punctiform impressions in the usual situation; viewed in the sun, the elytra exhibit changeable shades of blue and bronze; forebreast piceous; legs clear, testaceous. [Previously described as *Feronia* (*Pterostichus*) *erythropus*, by Dejean.]

[30] 36. *ARGUTOR BICOLOR*, Kirby. — Length of body 3 lines. Taken twice in lat. 54°.

Body glossy, above black, beneath mahogany coloured; antennæ and palpi at the base dark mahogany colour; prothorax longer than wide, rather narrowest at the base, where it is slightly sinuated, anterior angles rounded, without punctures, dorsal channel slight, a deep short basilar furrow on each side; elytra slightly furrowed with impunctured furrows, the seventh from the suture obsolete; in the interstice between the second and third are three punctiform impressions, the anterior one adjoining the latter and the two posterior ones the former.

This species approaches very near to *A. erythropus*, Dejean, but it is smaller, and the posterior angles of the prothorax are not rounded. The under side of the body, the legs and antennæ, are all of the same colour, sometimes a little darker, at others a little paler. [The genus *Argutor*, Meg. is now included in *Pterostichus*.]

37. *ARGUTOR* [*PTEROSTICHUS*] *FEMORALIS*, Kirby. — Length of the body 3½ lines. Taken in lat. 54°.

This species approaches very near to the preceding one, and its place is between that and *A. vernalis*, of which it is the American representative. It differs from *A. bicolor* chiefly in having only the scape of the antennæ and the tibiæ and tarsi of a different colour from the rest of the body, and in having the anterior half of the furrows of the elytra slightly punctured; and from the latter in having the prothorax narrower at the base, with only a single impunctured impression on each side. [We have received a specimen

of this species, taken in the United States, from our friend Mr. F. G. Sanborn, of Boston, Mass.]

[31] 38. ARGUTOR [PTEROSTICHUS] MANDIBULARIS, Kirby. — Length of the body $3\frac{1}{2}$ lines. Taken in lat. 54° .

Body glossy, underneath black, above black-bronzed; mandibles, palpi, scape of antennæ and legs rufous, or rather pale chestnut; frontal impressions rather wide; prothorax truncato-obcordate, with a basilar furrow on each side and a few punctures at the posterior angles; elytra lightly furrowed, with punctures in the furrows; two punctiform impressions in the usual situation, one a little beyond the middle of the elytrum, adjacent to the second furrow, and the posterior one near the apex adjacent to the third.

Variety B. Black above, with the whole antennæ rufous, elytra piceous. perhaps an immature specimen.

39. ARGUTOR [PTEROSTICHUS] BREVICORNIS, Kirby. Plate viii. fig. 3. — Length of body 3 lines. Taken in lat. 65° .

This with the preceding species, in the shape of the prothorax, which is obcordate, departs a little from the others. *A. brevicornis* resembles *A. mandibularis* in many respects, but the body is black, as are also the mandibles and palpi; the antennæ of the male are shorter, and those of the female not longer, than the prothorax; one of these organs in the latter sex, in the only ♀ specimen taken, appears to have been affected by some disease, for the two last joints are larger than the preceding ones, so as to form a kind of knob; it is the right-hand antenna that is so circumstanced; the little furrows at the base of the prothorax are wider than in *A. mandibularis*; the elytra of the ♂ have three, and those of the ♀ four, punctiform impressions, all adjacent to the third furrow. The last eight joints of the antennæ in this species have less down and shine more than is usual with the ground beetles in general.

[LeConte, in his list, asks whether this species may not be equivalent to *P. fastidiosus*. Mann.]

[32] 40. OMASEUS [PTEROSTICHUS] ORINOMUM, Leach. — Length of body $5\frac{1}{2}$ lines. Taken frequently in lat. 54° and 65° .

Body oblong, glossy, black. Head rather ovate, underneath, in some specimens, chestnut, in others black; palpi piceous; prothorax subcordate, rather longer than wide; a deep, punctured, basilar impression on each side; posterior margin slightly sinuate; elytra subacuminate, lightly furrowed with from four to six largish impressions in the second and third furrows, the first usually being in the third and the second on the second furrow, but the others occasionally varying; the natural number of these impressions seems to be five; legs black, with piceous tarsi.

Variety B. Legs chestnut.

C. Tibiæ and tarsi chestnut.

From the number of specimens collected in the expedition, I should conjecture this to be one of the most common of North American insects. It appears, however, not to have been noticed by Say, nor was it amongst those collected by Dr. Bigsby in Canada, or by Dr. MacCulloch and Capt. Hall in Nova Scotia. [According to LeConte an erroneous determination for *P. luczotii*, Dej., a species taken in Ontario and Quebec.]

41. OMASEUS [PTEROSTICHUS] NIGRITA, *Curtis*.—[This is *P. caudicalis*, Say (Ent. Works, ii. 480); it has been taken at Ottawa by Mr. Billings.]

[33] 42. OMASEUS [PTEROSTICHUS] PICICORNIS, *Kirby*.—[Previously described as *P. mutus* by Say (Ent. Works, ii. 470); taken in Canada and the United States.]

[34] 43. STEREOCERUS [AMARA] SIMILIS, *Kirby*.—Plate viii. fig. 1.—Length of body $5\frac{1}{4}$ lines. A pair were taken in lat. 54° .

Body of a piceous-black, glossy. Palpi piceous; antennæ chestnut; frontal impressions deep, rather curving; occiput punctured with scattered punctures; prothorax nearly square with curved sides; basilar impressions wide, punctured, deeply bisulcate, with an elevated little ridge between them and the margin: elytra bronzed, furrowed, furrows scarcely punctured: legs pale chestnut. In the ♀ the elytra are not bronzed, the legs are darker, and the terminal joint of the palpi is longer.

[35.] CURTONOTUS [AMARA] CONVEXIUSCULUS, *Stephens*.—Length of body $5\frac{1}{4}$ lines. Taken in lat. 65° .

Body dark piceous, sometimes a little bronzed. Antennæ and palpi rufous; frontal impressions short, connected by a rather deep furrow; prothorax constricted and punctured at the base, depressed on each side; basilar impressions bisulcate; posterior angles acute, recurved; elytra furrowed, furrows punctured: sides of the ventral segments of the abdomen somewhat punctured and wrinkled, those of the mid-breast grossly punctured: legs chestnut.

[LeConte considers this an erroneous determination, and places it, with a mark of interrogation, as a synonym of his *A. laticollis*, stating (Pro. Acad. Nat. Sci., Phil., June, 1855, p. 347,) respecting the latter that it is "found in Nebraska Territory near the Rocky Mountains. Very similar to the European *A. convexiuscula*, but in comparison with that species the thorax is more rounded on the sides, more narrowed behind, and more finely margined."]

45. CURTONOTUS [AMARA] RUFIMANUS, *Kirby*.—Length of body 5 lines. Several taken in lat. 54° .

This is extremely similar to the species last described, from which it principally differs in having the legs of the colour of dark pitch, with the exception of the hands or anterior tarsi, which are rufous: the sides of the ventral segments of the abdomen also appear less conspicuously punctured.

[LeConte (*loc. cit.* p. 356) states that this is "probably a variety of *A. latifrons*, Lec., in which case the name will not have preference, as the description must be considered worthless, and moreover must be considered as erroneously separated from *A. convexiuscula*, Kirby." He makes the same remarks also upon the two following species: *C. brevilabris*, Kirby, and *C. latior*, Kirby.

45. *CURTONOTUS BREVILABRIS*, Kirby.—Length of body $4\frac{1}{2}$ lines. A single specimen taken in lat. 65° .

[36.] Like the preceding species, but smaller: the upper lip is blacker, not half so long and slightly emarginate: the elytra are dark, and the legs pale chestnut; the furrows of the former are less conspicuously punctured; the frontal impressions likewise are longer and connected by a slighter furrow.

47. *CURTONOTUS LATIOR*, Kirby.—Length of the body 5 lines. One specimen only taken.

This species has a good deal the aspect of *Bradytus apicarius*, but it is a larger insect and rather wider in proportion, and the bifid intermediate tooth of the lower lip proves that it is a true *Curtonotus*. Body piceous, above bronzed. Upper lip, palpi, antennæ, side-covers, and legs, all rufous; nose at the anterior margin has an obtuse-angular sinus; frontal impressions punctiform, connected by a slightly-drawn line or furrow: prothorax wider than long, the lateral margins forming a segment of a circle without any posterior constriction; at the base the prothorax is depressed, the basilar impressions are bisulcate, the inner furrow being the longest: furrows of the elytra punctured.

48. *PÆCILUS* [*PTEROSTICHUS*] *LUCUBLANDUS*, Say.—Many specimens taken in lat. 54° . [Excessively common in Canada; for description *vide* Say's Ent. Works, ii. 478.]

[37] 49. *PÆCILUS* [*PTEROSTICHUS*] *CASTANIPES*, Kirby.—Length of body $5\frac{1}{2}$ lines. One specimen only taken.

This species differs from variety D of *P. lucublandus* ("entirely black, with the sides of the prothorax impunctured, elytra violet"), which it much resembles, it being entirely black; in having slighter basilar impressions, less distinctly punctured: it has likewise only three punctiform impressions on the elytra, the granular reticulations of the substance of which are also more

easily discovered. [Considered to be merely a variety of *P. lucublandus* by LeConte.]

50. *PÆCILUS* [*PTEROSTICHUS*] *CHALCITES*, Say.—Only a single specimen taken.

[Not uncommon in Canada; for description *vide* Say's Ent. Works, ii. 479.]

ON THE ECONOMY OF A SPECIES OF *FEONUS*.

BY WM. COUPER, MONTREAL.

On the 8th of January last, while searching for hybernating Coleoptera in the woods near Ottawa, I had occasion to strip the bark of a decayed ash tree, under which, among other insect store, I found a small transparent and curiously formed cocoon containing a larva of a fly which was at that time unknown to me. The cocoon was imbedded in the bark, occupying what I am now led to believe the excavation made by a grub of *Cerambyx*, or some other Coleopterous bark-borer. When cocoons belonging to the genera *EVANIIDÆ* or *ICHNEUMONIDÆ* are found under bark of trees, or stones imbedded in the earth, we may safely assume that they are accompanied by parasites, and that the original possessor has been devoured because it was just the food that suited them. Thus it is not difficult to trace the economy of many species of the above named genera; but as I am not certain that either cocoon or insect were hitherto described, I have taken the trouble to send you the following. The shape of the cocoon is oblong, surrounded by a band, and covered by a thin pellucid lid, and the form resembles a small coffin. The head of the insect was placed at the small end, and the space in front of it is packed with minute particles of dust, evidently produced from the bark by the original occupier. Length of cocoon 3-8ths inch.

Feonus Arca, n. sp.—Head black, glossy, impunctured; eyes black, round; antennæ black, two-eighths of an inch long; thorax not so black as head; the sides beneath and between the wings dark chestnut, interspersed with short fulvous hairs; wings fuliginous; nervures and stigma black; legs black, hairy; base of the femora fulvous; abdomen bright red, with scattered fulvous hairs; ovipositor black, as long as antennæ. Length 3-8ths inch.

I have another cocoon of the same form in my collection, but the work of a larger species, being half an inch long. It therefore behoves that persons who wish to study the economy of these useful insects, should search for them early in autumn, when they will be discovered either destroying the larva or forming the cocoon in which they rest during the winter.

ENTOMOLOGICAL GLEANINGS.

BY W. SAUNDERS, LONDON, ONT.

With a fruit farm in the country frequently visited, and a fruit garden in town, my opportunities for observing the times and doings of insect foes and friends are sufficiently ample to satisfy the desires of the most active and enthusiastic "bug-hunter" that ever carried a net. Now a swarm of caterpillars disfigures the form and mars the beauty of a handsome tree, by consuming a considerable part of its foliage; again a host of aphides, by their constant sucking of the juices of the leaves, will cause them to shrivel, curl up, and often change color, and the enormous rate at which these creatures increase adds much to the difficulty of their extermination; or some unwelcome "little Turk" sits down uninvited to feast on our finest fruits, and, not satisfied with appeasing its own appetite, leaves its progeny behind to complete the work of destruction; or it may be some rascally borer insidiously undermines one's fondest hopes by girdling and thus destroying trees or shrubs whose growth has cost years of toil and watching. With the desire of helping fellow fruit-growers and others to a better acquaintance with these expensive insect guests, I purpose in this, and probably some subsequent papers, to record observations made from time to time as the season advances.

On the 6th of May the first foe was met. A lot of dwarf pear trees arrested attention from the backwardness of some as compared with others, the unequal way in which the leaves were expanding, and the dark color, almost black, of some of the buds and younger leaves. No caterpillars were to be seen, but on jarring the trees down came the enemy to the ground in considerable numbers, partly falling, partly flying. It proved to be a small bug, belonging to the true bug family, *Hemiptera*, and a species named *Phytocoris* (*Capsus*) *linearis*. I never remember having seen this creature doing damage before, so a careful examination of its work was made. Our foe "*linearis*" is not a "big bug;" it does not measure more than one-fifth of an inch. It is rather variable in color, from dull dark brown to greenish brown, or sometimes dirty yellowish brown. The males are usually darker than the females. The head is yellowish, and has three narrow reddish stripes. The beak or sucker is about one-third the length of the body, and when not in use is folded under the breast. The thorax has a yellow margin and several yellowish lines running lengthwise. Behind the thorax is a yellow V-like mark, sometimes more or less imperfect, but usually sufficiently clear to help one to a ready recognition of the species. The wings are a dusky brown, and the legs of a dull, dirty yellow.

This enemy ensconces himself within the young leaves of the just opening buds, puncturing them about their base and along the edges, and extracting

their juices with its beak. The result was to disfigure and sometimes entirely destroy the young leaves, causing them to blacken and shrivel up. They were also somewhat partial to the unopened buds, piercing them from the outside and sucking them nearly dry, when they also withered and blackened. Sometimes a whole branch would be thus affected, becoming first stunted, then withered, next dead. Dr. Harris, in his "Insects Injurious to Vegetation," mentions this bug as occurring in Vermont in large numbers in 1851, attacking almost every green thing and doing a great amount of mischief throughout the summer. In our own case they disappeared in about a fortnight, but left the trees in a very dilapidated state. Press of other work prevented any remedies being used. Probably a solution of soft soap or dry unslacked lime would have lessened their numbers.

On the 10th of May I was astonished to see the young larva of the gooseberry saw-fly, *Nematus ventricosus*, commencing its depredations on the freshly expanded leaves. This was nearly a month earlier than its usual time of appearing, the leaves having expanded about three weeks earlier than usual. On examining the under side of the leaves rows of white eggs were found in abundance in different stages of development. Those newly deposited were very much smaller than the others, and appeared to be but *slightly* attached to the surface, not let into a slit made in the leaf by the saw of the female, as is commonly supposed; at least I could find no traces of such an operation, although I examined them carefully with a microscope. The gooseberries were now in full bloom. In the second volume of the CANADIAN ENTOMOLOGIST, p. 16, and also at p. 48, an opinion is expressed that a cocoon of this insect found freshly made on the 29th of May was the work of a larva which had wintered over. The observations made this spring do not in any way upset this idea, for the earliness of the season will account for the apparent discrepancy. They will certainly prove very troublesome this season they are so very abundant, and now, at the last of the month, when many of the full-grown larvæ have gone into chrysalis, freshly-laid eggs or larvæ just hatched may be found on almost every bush. Remedy—patience and plenty of hellebore, an ounce or two to the pailful, and shower lightly on the bushes with a watering pot.

There is a small caterpillar, a leaf-roller or case-maker, which is very troublesome. It probably passes the winter in the caterpillar state, for almost as soon as the buds begin to burst it begins its mischievous operations, and when first observed is not usually more than half grown. It is a very small thing even when full grown, being then half an inch in length, with a small shining black head and a dirty brown colored body, with a few small brown dots and fine hairs scattered over its surface. Its tenement consists of a

dried-up, blackened leaf, portions of which are drawn together so as to make a rude case, the centre part of which, where his highness resides, is lined with silk. It is very fond of going just where you do not want it. It is partial to the blossoms and newly-formed fruit. If you have a new pear or apple fruiting, with a single bunch of blossom on it, which you are anxiously watching, by-and-by you find that several of the blossoms have set, and while you are flattering yourself that they are doing well, along comes this mischief-maker, pitches his tent alongside this very spot, and drawing the young fruit together with silken threads, holds high carnival among them and frustrates your hopes. Another of its tricks is to gnaw a hole into the top of the branch from which your bunch of blossom issues, and, tunnelling it down, cause the whole thing to wither and die. Often it contents itself with damaging the leaves only, and this one does not mind so much, drawing one after another around its small inside case, until it forms quite a little belt of withered and blackened leaves.

Hand picking is the only remedy suggested for these, unless you can employ small birds, such as sparrows, in hunting them up for you.

The moth which this caterpillar produces is rather a pretty little thing. Its name we are not yet able to give. It measures, when its wings are expanded, about half an inch. Its fore wings are greyish brown, with a shining white, almost silvery band across the middle, widest on the front margin. The hind wings are plain pale blue, and both are prettily fringed with fine brown hairs, those on the hind wings longest. It appears on the wing from the middle of June until the early part of July. It probably lays its eggs on the leaves, and when the young worms appear, which is most likely early in the fall, they make their small inner silken case, and, attaching themselves to some part of the tree, remain unobserved, and in this condition probably winter, awaking to new life and energy with the opening spring.

ICHNEUMON IN A SPIDER'S COCOON.

BY WM. COUPER, MONTREAL.

I inclose an ichneumonid spider's cocoon, which I found on the mountain of Montreal early in May last. When I opened the cocoon, the larvæ had a bluish colour and were quite active. It produced about forty specimens of the fly, which I send you, as I have no means at hand of determining the species. There is however a very nice investigation in regard to the economy and *modus operandi* of this little ichneumon. That is, how does it reach the spider's eggs? I cannot detect an ovipositor, and the body of the creature itself is only about a sixteenth of an inch long. The eggs were protected with a dense covering of silk, which interiorly was very hard and difficult to

penetrate ; still I cannot see any other way by which it could reach the eggs, unless the spider was compelled to retreat from the nest, when it was only partially covered with silk, and that the little ichneumon deposited her eggs amongst the group during the absence of the spider. If such is the case, the habits of the minute ichneumonidae are similar to those of the small parasitic species of *Microgaster*, for the latter always use stratagem, and, like the Dipterous cuckoo-flies, take advantage to deposit their eggs during the absence of the true owner of the nest. I do not know the species of spider to which the cocoon belongs.

NOTICE OF THE SPECIES OF DREPANODES.

BY AUG. R. GROTE, DEMOPOLIS, ALA.

It is easy to distinguish the species of the genus *Drepanodes* from the other Phalaenidae, by their falcate or acutely produced primaries and their strong casual resemblance, both in size and ornamentation, to the *Platypteryginae* (*Drepana*, *Platypteryx*, *Dryopteris*), a sub-family of *Bombycidae*. This resemblance, while it has suggested to M. Guenée the generic name, is paralleled in the sub-order in different instances ; but is here noteworthy as illustrating the synthetic relation which the great family *Bombycidae* sustains to the other moths. The nearer affinities of *Drepanodes* in its family are with *Chaerodes*.

In the eighth volume of the *Annals of the Lyceum of Natural History of New York*, will be found figures and descriptions of three species of this genus. Of these I have found *D. puber* and *D. varus* in central Alabama. A fourth, which I here describe, I have from the same locality. This species (*D. sesquilinea*) I believe to be identical with one of which I have seen many specimens from New York and Massachusetts, but which I cannot at this writing compare. This not improbably will be found in Canada. *Drepanodes sesquilinea*, n. sp.

Male. Pale smooth fawn colour, slightly lustrous ; irrorations sub-obsolete. Both median lines distinct on the primaries above. The inner roundedly angulated on the disc approximate to the black discal dot. The outer acutely angulated below costa, consisting of a very narrow whitish external line and a deep olivaceous preceding shade. Apices moderately produced. External margin lined with olivaceous. Terminally there are distinct dark clouded spots interspaceally, between the nervules, at the middle of the wing. On the secondaries the external line is distinctly continued. External margin edged with olivaceous and stained centrally with ochreous. Outside of the external line both wings are shaded with purplish. Beneath a little darker and more irrorate ; the external line is visible on both wings and the black

discal dots. The long testaceous antennae are bi-pectinate to the tips. The body parts are paler than the wings. *Expanse* 26 m. m.

The less olivaceous more purely fawn and paler colour of this species, together with the deep and distinct lines above on the primaries, will distinguish it from *D. puber*, which it resembles in the shape of the fore wings. The squamation is close and a little lustrous.

MISCELLANEOUS NOTES.

REARING EGGS OF BUTTERFLIES.—I have been so successful this season in persuading female butterflies to deposit their eggs in captivity, that I think it well to mention the matter in the *Entomologist*. Last season I found it impossible to induce *P. Marcellus* to lay upon leaves or stems of pawpaw that had been cut. This spring I placed a nail-keg, from which the bottom had been knocked out, the top being covered with cloth, over a low pawpaw growing near my house; and on confining a female *Ajax* therein, she at once began to deposit her eggs, and continued till the number reached more than twenty. In a few days the young larvæ came out, and with very little trouble I succeeded in raising several of them to the chrysalis state, in which they now are. (I expect to prove by this brood that *Marcellus* and *Ajax* are but different broods of the same insect; a fact I have felt confident of for some years past, but which I could not absolutely establish for want of the link which this experiment will supply). I afterwards treated other females of *Ajax* in the same manner, and with the same results.

A *C. Philodice*, confined in the same way with growing clover, at once deposited a great number of eggs. So did *Nisoniades Lycidas*, and *N. Pylades*, Scudder, upon *Hedysarum*. In fact in every instance so far tried, the females have obliged me with as many eggs as I wanted; and I incline to think this mode of taking eggs will always be successful.—W. H. EDWARDS. Coalburgh, West Va.

COLORADO POTATO BEETLE.—This most destructive insect (*Doryphora 10-lineata*, Say) has appeared in the western parts of this province, and is already committing great ravages upon the potato plants. We have received specimens both in the larval and imago states from Windsor, county of Essex, and Colville, county of Lambton, Ont. The most approved remedy for it is to dust the affected plants with a mixture of one part of Paris green and six parts of flour or ashes. Detailed illustrated descriptions of the insect may be found in the *American Entomologist* for November 1868, and in the forthcoming number of the *Weekly Globe* and *Canada Farmer*.

THE CURRANT-BUSH SAW-FLY.—I have moved this year to a house where there is a garden, in which I have made an unexpected discovery, namely,

that *Nematus ventricosus*, Klug, is found at Quebec. The larvæ have been very destructive, stripping some of the gooseberry and currant bushes almost before I knew they were there.—G. J. BOWLES, Quebec. [This pestilent saw-fly has been more than usually destructive this year in the province of Ontario. It appears now to have spread over the whole Dominion of Canada, as well as over some of the neighbouring States; last year we received specimens from Mr. J. M. Jones, of Halifax, Nova Scotia.—Ed.]

AMERICAN BUTTERFLIES AND MOTHS.—(1) Do you know of any work on *American Butterflies and Moths*, publishing in numbers in cheap form, like Newman's *British Moths and Butterflies*, in which every known specimen is figured and described in caterpillar, chrysalis and perfect state, both male and female? and if not, would not such a work pay? (2) Would it not be a good plan to begin such a work in the CANADIAN ENTOMOLOGIST, taking, say butterflies first, each variety in succession, giving scientific and popular names, with wood-cuts of caterpillar, chrysalis, and full grown insect, one in each number till the work is completed? — J. W. H. ROWLEY, Yarmouth, Nova Scotia. [REPLY by ED. C. E.—(1) There is no such work being published in parts; but Mr. Scudder, of Boston, Mass., has in preparation an elaborate work on the Butterflies of New England, which will include probably all the Canadian species. It is to contain descriptions, with coloured illustrations of the eggs, larvæ, pupæ, imagines and parasites, of all the species found in the New England and neighbouring States and Provinces. It must necessarily be an *expensive* work, though no doubt it will be issued at as cheap a rate as possible. It is rather difficult to say whether such a work as Mr. Rowley contemplates would *pay* in America; if well got up and made interesting and attractive to the ordinary collector it might obtain a large sale, but Entomology has hardly a sufficient number of votaries on this Continent as yet to assure against loss in such an undertaking. As far as a work on the Butterflies alone of North America is concerned, nothing can surpass in beauty and excellence Mr. Edwards' work, now being issued in quarterly parts, but of course it is not a cheap work, each part being \$2 50 in U. S. currency, though well worth the money. (2) We should be delighted to carry out such a work in the numbers of the CANADIAN ENTOMOLOGIST, had we sufficient means to pay for the wood-cuts. If any enthusiastic Entomologist will supply the necessary funds, or give us a sufficient guarantee against loss, we shall be only too happy to do all the rest of the work to the best of our ability.]

AMERICAN ASSOCIATION.—The nineteenth meeting of the American Association for the Advancement of Science will be held at Troy, N. Y., commencing on Wednesday, August 17th, 1870. The Local Secretaries are Messrs. B. H. Hall and H. B. Nason, Troy, N. Y.

LIST OF COLEOPTERA,

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from page 103.)

RHIPICERIDÆ.

**Sandalus niger*, *Knoch*.

DASYLLIDÆ.

Eurypogon niger*, *Motsch*.*Cyphon nebulosus*, *Lec*.modestus, *Lec*.ruficollis*, *Say*.*fuscipes*, *Kirby*.*piceus*, *Lec*.*Prionocyphon discoideus*, *Say*.**Helodes pulchella*, *Guer*.**Eucinetus terminalis*, *Lec*.

LAMPYRIDÆ.

Dictyoptera perfaceta, *Say*.*Calopteron reticulatum*, *Fab*.**Cænna dimidiata*, *Fab*.**basalis*, *Lec*.*Eros coccinatus*, *Say*.*mundus*, *Say*.**thoracicus*, *Rand*.*sculptilis*, *Say*.**oblitus*, *Newm*.**crenatus*, *Germ*.*humeralis*, *Fab*.**modestus*, *Say*.*mollis*, *Lec*.*canaliculatus*, *Say*.**Calyptocephalus bifarius*, *Motsch*.*Lucidota atra*, *Fab*.*Photinus corruscus*, *Linn*.*nigricans*, *Say*.*angulatus*, *Say*.*Photinus borealis*, *Rand*.*ardens*, *Lec*.*marginellus*, *Lec*.**scintillans*, *Say*.*Photuris Pensylvanica*, *De Geer*.**Phengodes plumosa*, *Hoff*.*Chauliognathus Pensylvanicus*,
De Geer.*Podabrus basillaris*, *Say*.**flavicollis*, *Lec*.*modestus*, *Say*.*diadema*, *Fab*.*rugulosus*, *Lec*.**piniphilus*, *Esch*.*punctatus*, *Kirby*.¹**puncticollis*, *Kirby*.**laevicollis*, *Kirby*.*pattoni*, *Lec*.*Telephorus excavatus*, *Lec*.*Carolinus*, *Fab*.*angulatus*, *Say*.**lineola*, *Fab*.*rectus*, *Mels*.**imbecillis*, *Lec*.**flavipes*, *Lec*.**nigriceps*, *Lec*.*fraxini*, *Say*.*rotundicollis*, *Say*.*tubereulatus*, *Lec*.*bilineatus*, *Say*.*Silis percomis*, *Say*.**Trypherus latipennis*, *Germ*.

* Species marked with an asterisk have not before been included in the list of Canadian Coleoptera.

¹ An individual of this species is remarkable for having three antennæ. The duplicate, which is placed directly in front of the right antenna, consists of ten joints with a three-jointed branch from the base of the ninth.

**Malthinus occipitalis*, *Lec.*

**Malthodes concavus*, *Lec.*

**transversus*, *Lec.*

MALACHIDÆ.

Collops 4-maculatus, *Fab.*

vittatus, *Say.*

**Anthocomus flavilabris*, *Say.*

**Attalus melanopterus*, *Er.*

**morulus*, *Lec.*

**Ebæus oblitus*, *Lec.*

**Melyris cribratus*, *Lec.*

CLERIDÆ.

**Cymatodera bicolor*, *Say.*

**Priocera castanea*, *Newm.*

Trichodes nuttalli, *Kirby.*

Clerus nigripes, *Say.* (var.)

**nigrifrons*, *Say.*

**thoracicus*, *Oliv.*

trifasciatus, *Say.*

dubius, *Fab.*

sanguineus, *Say.*

**Hydnocera unifasciata*, *Say.*

pallipennis, *Say.*

verticalis, *Say.*

**longicollis*, *Zieg.*

**Phyllobænus dislocatus*, *Say.*

**Ichne laticornis*, *Say.*²

Chariessa pilosa, *Forst.*

onusta, *Say.*

**Orthopleura damicornis*, *Fab.*³

**Laricobius rubidus*, *Lec.*

Corynetes violaceus, *Linn.*

LYMEXILIDÆ.

**Lymexylon sericeum*, *Harris.*⁴

CUPESIDÆ.

Cupes capitata, *Fab.*

concolor, *Westw.*

PTINIDÆ.

Ptinus fur, *Linn.*

Eucrada humeralis, *Mels.*

**Ernobius mollis*, *Thom.*

**tenuicornis*, *Lec.*⁵

**Oligomerus sericeus*, *Lec.*

**Sitodrepa panicea*, *Thom.*⁶

**Trichodesma gibbosum*, *Say.*

**Hadrobregmus errans*, *Mels.*

**carinatus*, *Say.*

linearis, *Lec.*

**Petalium bistriatum*, *Say.*

Anobium notatum, *Say.*

**Tripopitys sericeus*, *Mels.*

**Xyletinus peltatus*, *Harr.*

fucatus, *Lec.*

**Hemiptychus gravis*, *Lec.*⁷

**Prothea puberula*, *Lec.*

**Cænocara oculata*, *Lec.*

Ptilinus ruficornis, *Say.*

**thoracicus*, *Lec.*

Endecatomus rugosus, *Rand.*

Bostrichus serricollis, *Germ.*

**truncaticollis*, *Lec.*⁸

Lyctus striatus, *Mels.*

² July, on hickory.

³ July 27th, on hickory.

⁴ Under bark of dead oak, in August.

⁵ On pine, May 31st.

⁶ Drug store, Grimsby, in *Cantharis vesicatoria*.

⁷ Bred from woody fungus.

⁸ Under bark of black ash stumps; last of July.

LIST OF COLEOPTERA

COLLECTED BY A. S. PACKARD, JUN., AT CARIBOU ISLAND, LABRADOR,
STRAITS OF BELLE ISLE.

The Coleoptera here enumerated, and named several years since by Dr. Leconte, were collected by me during the summer of 1860 at Caribou Island while a member of the Williams College expedition to Labrador and Greenland under the direction of Prof. P. A. Chadbourne. This is an incomplete list of the Coleoptera of Labrador; and in a subsequent expedition with my friend, Wm. Bradford, the artist, to Hopedale, Labrador, many more forms, as yet not named, were collected.—A. S. P

Gyrinus, not determined.

Agabus punctulatus, Aubé.

“ *laevidorsus*, Lec.

“ *semipunctatus*, Kirby.

“ *subfasciatus*, Lec.

“ *infuscatus*, Aubé.

Colymbetes sculptilis, Harris.

“ *picipes*, Kirby.

Hydroporus tenebrosus, Lec.

Silpha Lapponica (Linn.)

Creophilus villosus, Grav.

Amara similis, Lec. (*Stereocerus*
similis, Kirby).

Amara near *melanogastrica*, Esch.,
perhaps *brunnipennis*, Dej.

Calathus confusus, Lec.

Bledius, not determined.

Ips sanguinolentus, Oliv.

Byrrhus Americanus, Lec.

“ *Kirbyi* (*picipes*, Kirby).

Eanus vagus, Lec (*Limoniæ vagus*,
Lec.)

“ *maculipennis*, Lec., n. sp.

Philhydrus bifidus, Lec.

Podabrus mandibularis (*Acmæops*
proteus, Lec., *Lepr. proteus*, Kirby.

Atomaria, not determined.

Criocephalus agrestis, Kirby.



BOOKS RECEIVED.

Glimpses of Nature, a Magazine of Natural History in all its branches. Edited by Samuel M. Maxwell. Vol. i. No. 1. Mauch Chunk, Pa., June, 1870.—A new and neatly printed periodical, to which we wish all possible success.

First Annual Report of the American Museum of Natural History. January, 1870. New York.

Notes on Graptas C-aureum and interrogationus, Fab.; and *Descriptions of new species of Diurnal Lepidoptera found within the United States*. By Wm. H. Edwards. Among the eighteen new species described in the latter paper is one, *Pieris Virginiensis*, that has been taken in London, Ont., by Mr. Saunders.

Proceedings of the Boston Society of Natural History. Vol. xiii. pages 225 to 256.—*Hardwicke's Science Gossip*. Nos. 64 to 67.—*Nature*. Nos. 22 to 33. *Le Naturaliste Canadien*, Vol. ii., Nos. 5, 6, 7.—*The American Naturalist*, Vol. iv., Nos. 2 to 5.—*The American Entomologist and Botanist*, Vol. ii., Nos. 6 to 8.—*Petites Nouvelles Entomologiques*—*The Rural New Yorker*—*The Prairie Farmer*—*The American Agriculturist*—*The Maine Farmer*—*The*

Bunker Hill Aurora—*The Weekly N. Y. Sun*—*Arthur's Home Magazine* and *The Children's Hour*—*The Canada Farmer*—*The Journal of Education*, Toronto. Vol. xxiii., Nos. 1 to 5—*Newman's Entomologist*, Nos. 75 to 78 (from Mr. Reeks)—*The Horticulturist*, New York. Nos. 286 to 288.

CHANGE OF ADDRESS. — Mr. Wm. Couper, Naturalist, has removed from *Ottawa, Ont.*, to MONTREAL, P. Q.

ADVERTISEMENTS.

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Petites Nouvelles Entomologiques (\$1.20), and the *Canadian Entomologist* (\$1) for \$2.

AGENTS FOR THE CANADIAN ENTOMOLOGIST.

CANADA—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P. Q.; G.

J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y.

Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, N. Y.

ENGLAND.—Wm. Wesley, 81 Fleet Street, London, E. C. Subscription 5s. per Vol.

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The Canadian Entomologist.

VOL. II.

TORONTO, AUGUST 31, 1870.

No. 9.

APOLOGETIC.

The Editor begs that the readers of the CANADIAN ENTOMOLOGIST will accept his apologies for the delay that has taken place in the issue of the present number. Since the date of the last number, he has made a complete change of occupation and residence, and his time has been so much encroached upon in consequence that it has been quite impossible for him to superintend the publication of this number until the present late date. For some years past he has been in charge of a large rural parish, the manifold duties of which gradually increased to such an extent as to leave him very little leisure for Entomological work; recently, however, he was offered, and, after some consideration, accepted the Head Mastership of the Trinity College School at Port Hope—a preparatory institution to the Church of England University at Toronto. During the last few weeks his time, as can readily be imagined, has been entirely engrossed with the arrangement of matters in his late parish, and the toil and trouble of removal. He has ventured to make this personal explanation in order that the reader may understand and excuse the long delay incurred in the issue of this number—a delay which, he trusts, will not soon recur.

His address is now: "THE REV. C. J. S. BETHUNE, *Trinity College School, Port Hope, Ont.*" Exchanges will please address: "CANADIAN ENTOMOLOGIST, *Port Hope, Ont.*"

ACCENTUATED LIST OF CANADIAN LEPIDOPTERA,

BY E. B. REED, LONDON, ONTARIO.

This List is compiled on the same principle as the Oxford and Cambridge Accentuated List of British Lepidoptera, of which valuable little book we have made free use. A quotation from its preface well explains our object:

"The want of uniformity in the pronunciation of scientific names, and the consequent difficulty of communication between the less educated, but often more practical men of science, is an admitted evil. To afford a remedy so far as Lepidopterology is concerned, and for the especial use and benefit of those to whom circumstances have denied the advantage of a classical

education, while their inborn love of Natural History has led them to the study of this order of insects," we have published this accentuated list of Canadian Lepidoptera.

RULES FOR PRONUNCIATION.

Every vowel is to be pronounced short unless marked long, thus ē.

TABLE OF VOWEL SOUNDS.

a	is to be pronounced as in the word "hat."	ā	as in "hate"
e	" " " " "met."	ē	" " "mete."
i	" " " " "hid."	ī	" " "hide."
o	" " " " "hop."	ō	" " "hope."
u	" " " " "duck."	ū	" " "duke."

Two vowels occurring together, and not joined as in the diphthongs, are to be pronounced as two syllables; thus, *Regiella* pron. *Re-gi-el-la*, not *Re-giel-la*.

TABLE OF CONSONANT SOUNDS.

c is to be pronounced hard, as *k*.

ç " " soft, as *s*.

ch " " hard, as *k*, except where preceded by *s*, in which case the "*sch*" is equivalent to *sh*, and is printed *sch*: thus, *Frischella*, pron. as *Frishella*.

g is to be pronounced hard, as in "gate."

g " " soft, " "gem."

The position of the accent (') shows where stress is to be laid: viz., on the syllable preceding the accent.

LEPIDOPTERA—*Lepidop'tera*. Gr. *Lepis* a scale, *pteron* a wing. Insects whose wings are clothed with scales.

DIURNI—*Diur'ni*. Day-fliers.

RHOPALOCERA—*Rhopaloc'era*. Gr. *Rhopalon* a club, *keras* a horn. Insects whose antennæ are clubbed at the extremity. All butterflies have this peculiarity.

PAPILIONIDÆ—*Papilio'nidæ*—the family of which the genus *Papilio* is the type.

PAPILIO—*Papilio*, a butterfly. Linnæus first attempted to combine in some degree Natural and Civil History, by attaching the names of personages illustrious in their day to insects of particular kinds. His first division of the Butterflies consists of *Equites* (Knights), and these are sub-divided into *Troes* and *Achivi* (Trojans and Greeks).

TURNUS—*Tur'nus*. A prince of the Rutuli, who contended with *Ænæas* for the princess Lavinia.

TROILUS—*Tro'ilus*. A son of Priam and Hecuba killed by Achilles.

PHILENOR—*Phile'nor*. A Grecian proper name.

ASTERIAS—*Aste'rias*. Daughter of Cæus and Phœbe, and sister of Latōna.

THOAS—*Tho'us*. King of Chersonesus to whom Iphigenia was brought.

AJAX—*Ajax*. A Grecian hero, son of Telamon.

PIERIDÆ—*Pieridæ*. The family of which the genus *Pieris* is the type.

PIERIS—*Pi'eris*, a Muse. The Muses derived their name Pierides from Mount Pierus, where they were worshipped.

PROTODICE—*Prōto'dice*. Gr. "Protos" first, "Dice" the name of one of the hours—in allusion probably to this insect being one of the earliest to appear in Spring.

RAPÆ—*Rāpæ*. Feeds on Rape. (*Brassica Rāpæ*).

OLERACEA—*Olerā'cea*. Feeds on Cabbage (*Brassica Olerācea*).

COLIAS—*Cōlias*. A surname of Venus from a promontory in Attica where she was worshipped.

NOTES ON SOME OF THE COMMON SPECIES OF CARABIDÆ, FOUND IN TEMPERATE NORTH AMERICA.

BY PHILIP S. SPRAGUE.

ARTICLE NO. IV.

Harpalus (*Carabus*) *pensylvanicus*, Degeer. Mem. Ins. IV. 108. Reddish brown; head dusky; shells striate; body beneath, antennæ and feet testaceous. Inhab. Penn. N. A. Tast p. 104, t. IV. f. 22, Degeer.

H. (C.) pensylvanicus. Winged; body above black; beneath ferruginous. N. A. Fab. Syst. Elut. I. 195.

H. (C.) pensylvanicus. Resembles *ruficornis*. Head black; thorax almost square, with a longitudinal line impressed in the middle and two posterior impressions; elytra black, striated; body beneath brown, more or less clear. Oliv. III. 57, t. XI. f. 92 b.

H. bicolor, Say. Head black; mouth and antennæ rufo-testaceous; gula piceous; thorax glabrous on the disk; a dorsal impressed line; area of hind angles impressed and confluent punctured; posterior angles rounded; elytra striate; striæ impunctured; margin with numerous punctures; pectus and post-pectus piceous-black; piceous on the disk, with obsolete punctures; feet testaceous pale; venter piceous-black; tail paler. Trans. Amer. Philo. Soci. II. 26.

H. faunus, Dej., and *flavipes*, Dej., Cat. 3rd ed. p. 15. Oblong oval; above black; thorax nearly square; on both sides behind punctured; basal foveæ distinct; posterior angles nearly right; elytra striate; sides obsoletely punctured; behind obliquely sinuate; antennæ and feet testaceous. Dej. Sp. IV. 254. The foregoing descriptions are supposed by Dr. LeConte to refer to one and the same species described by Degeer as *Carabus pensylvanicus*, and this decision is now acquiesced in by other entomologists. This example of the lack of minute and systematic description is only one of the many; in fact it is the rule, as you will see by the many synonyms attached to other species, and is the great difficulty all students experience in determining them.

Harpalus pensylvanicus, Dej, N. A. Long. .55 in. (45-55). Broad oblong oval, above usually dull black; sub-Alpine and northern varieties blacker and more shining; legs, antennæ and mouth testaceous yellow; thorax one-fourth broader than long, scarcely narrowed behind the middle; sides broadly rounded and strongly depressed; the margin is quite narrow at

the apex, widening posteriorly, and absorbing the whole basal foveæ, making a broad flattened space internally from the apex of the basal angle; basal foveæ strongly marked, and with the margin heavily and confluent punctured; basal angles obtuse, somewhat rounded; elytral striæ deep; interstices convex, and at the sides punctured, in some specimens confluent; no dorsal puncture; mentum distinctly toothed. The broadly rounded sides, the wide and punctured margin of the thorax, with the side punctures of the elytra, are the special parts that differ from the following species, to which it is most nearly allied.

Harpalus compar, Lec. — Mass. to Cal. Long. .55 in. Oblong oval; above reddish black, somewhat shining; beneath lighter; legs, antennæ and mouth reddish yellow; thorax one-fourth broader than long; strongly but narrowly depressed at sides; distinctly narrowed behind; basal foveæ shallow, confluent punctured in centre; basal angles obtuse, scarcely rounded; flattened above, and with the side margin finely punctured; elytral striæ well marked, not deep, with the interstices flattened, and with a few obsolete punctures at the sides; no dorsal puncture; mentum tooth distinct. This species differs from *H. pensylvanicus* by the thorax being distinctly narrowed behind the middle instead of broadly rounded; the depressed margin is narrower; not so broad and flattened at the basal angle, yet somewhat depressed; the punctures are finer and not confluent except in basal foveæ; the apex of basal angle is quite well defined; the interstices of elytra are flat; the punctures at the sides nearly obsolete; sometimes only a few points are seen on the seventh and ninth interstices. This beetle was described quite a number of times by our early entomologists under different names, which being pre-occupied necessitated a new one, which was given by Dr. LeConte.

Harpalus erythropus, Dej. Oblong oval; above black; thorax nearly square; punctured on both sides behind; basal foveæ shallow; posterior angles nearly right; elytra striate; behind obliquely sinuate; antennæ and feet reddish-yellow. Long. $5\frac{1}{2}$ lines. Penn. This beetle much resembles *faunus* (see under the head of *H. pensylvanicus*), but is a little smaller; it is very nearly of the same color; the thorax is less rounded at the sides; sides not depressed; basal foveæ less marked; elytra nearly of the same form; interstices smooth, not punctured at the sides; palpi, antennæ and feet reddish-yellow. N. A., Dej. Sp. IV. 258. The above is a translation of the original description of DeJean. My description of *H. compar* will answer for this species, with the following differences: it is much smaller; long. .44–.50 in.; the sides of the thorax are perhaps more distinctly narrowed; the punctures of basal foveæ and sides a very little deeper, and without punctures at sides of elytra. Were a large *erythropus* and a small *compar* placed side by side, the only real difference would be the punctures

at the sides of elytra. These two species run so close together as to make it doubtful if they are distinct. The three species just described, with an intermediate one, *H. longicollis*, Lec., which I will leave for a future time, have puzzled carabæan entomologists from the first describers to the present time, and I fear that until we have some additional way of determining species we shall still continue in doubt. With quite a large series coming from Texas to Oregon and from Canada to Florida, I am at a loss where to place some examples, they so strongly partake of what we consider two distinct species. The preceding descriptions are typical forms which will absorb the mass of all captures.

Since Article No. 2 was written, I have received from Missouri *Harpalus testaceus*, Lec. (See page 59, Vol. 2.) Oblong oval; reddish yellow, shining; thorax more than one-half shorter than broad; posterior angles right, quite prominent, with the base on both sides shortly impressed; elytra at apex scarcely sinuate; striæ obsoletely punctured; interstices a little convex, with a single puncture on the third.—Trans. Phil. Philo. Soci. X. 385. In addition to the above, which is Dr. LeConte's description translated, I will describe the specimen in my cabinet. Long. .39 inch; uniformly light testaceous; thorax nearly twice broader than long; narrow and sinuated at the sides behind the middle; strongly and broadly depressed; basal angles obtuse; apex prominent; basal foveæ are impressed points; elytral striæ deep; interstices convex; no dorsal puncture; body beneath has accessory ambulatorial setæ. Dr. LeConte says, Pro. Acad. Nat. Sci. 1855, p. 101, "elytra without dorsal puncture." With the above corrections this beetle will be readily recognized.

Harpalus faunus, Say.—Long. .42–.55 in.; oblong oval; reddish black, shining, lighter beneath; thorax nearly square, margins lighter, clear; sides sub-parallel, strongly depressed; basal foveæ broad, deep, and with the margin well punctured; basal angle right, apex slightly rounded; elytral striæ deep; interstices convex, not punctured; ♀ has a row on the seventh, and sometimes also on the ninth, which, with the square thorax, and light margins, makes this a well-marked species.

A MONTHLY journal has been started in Jena devoted to the interest of Sericulture.

ILLINOIS STATE ENTOMOLOGIST.—We learn that Dr. Wm. LeBaron, of Geneva, Kane county, Ills., has been appointed to the office of State Entomologist, made vacant by the death of our late associate. Well done, Governor Palmer! Our Illinois friends have good cause to rejoice at the appointment!—*Amer. Entomologist*.

ENTOMOLOGICAL GLEANINGS.

PAPER No 2.

BY W. SAUNDERS, LONDON, ONT.

Phytocoris linearis (*Capsus oblineatus*, Say.)

I regret that I had not observed before writing paper No. 1, a valuable article by my esteemed friend Riley on this insect, in his last Annual Report on the insects of Missouri. He there speaks of effects produced by it on young pear trees in that section, precisely similar to those I described, and expresses the opinion, which I also entertain, that the puncture of this insect is peculiarly poisonous to the young growth on the tree. He says, "it attacks many kinds of herbaceous plants, such as dahlias, asters, marigolds, balsams, cabbages, potatoes, turnips," &c., and several other trees, besides pear, viz., quince, apple, plum, and cherry. They deposit their eggs and breed on the plants, and the young and old bugs together may be noticed through most of the summer months. The young bugs are perfectly green, but in other respects do not differ from their parents except in lacking wings. There are probably two broods during the season, I have observed the full grown bugs throughout the summer, but more abundant early in August, I noticed them very numerous about some swollen diseased ears of corn, resulting from that peculiar black fungoid growth to which it is at times subject. Mr. Riley suggests as remedies strong tobacco water, quassia water, vinegar, and cresylic soap.

Affecting the apple, Phycita nebulo, Walsh.

While looking over some apples trees, on the 23rd of May, I observed the work of a small case-making larva, which I had never noticed before. Its case resembled a long miniature horn, wide at one end, tapering almost to a point at the other, and frequently twisted in a very odd manner. There were generally portions of dead leaves fastened around the case, so as to partially conceal it, and a firm base of attachment was made for it by gnawing off the young bark from the twig on which it rested, and then firmly gluing it with some glutinous secretion to the spot thus laid bare. The case was curiously constructed of silk interwoven very cleverly with the excrement of the artificer, and had a smooth whitish surface internally, with an exterior also smooth, but of a yellowish brown color.

The larva lives inside this curious structure, coming out only when it wants food, and quickly retreating when danger threatens. Its length when full grown is about six tenths of an inch, with a body tapering slightly towards the hinder extremity. Its head is medium sized, rather flat, dark reddish brown with a dull roughened surface, mandibles or jaws dark shining brown,

The body above is dark dull brown with a slight greenish tint, the second segment being nearly covered above with a horny looking plate, similar in appearance to the head, but a little paler, and edged behind and at the sides with a darker shade—on each side below this plate is a flattened blackish prominence—on each side of third segment is also placed a small shining black tubercle. On each segment from the third to terminal inclusive, are several very minute blackish dots, from each one of which arises a single pale brown hair.

The under surface is a little paler than the upper, with a more decided greenish tint, feet green banded and tipped with brownish black, prolegs dull greenish brown.

It changes to a chrysalis sometimes, and I think usually within the case. I found them thus changed in some cases on the trees, but one or two of the specimens among those brought home and fed, came out of the case, and changed to a pupa on the outside. The chrysalis was about four tenths of an inch long, and of a reddish brown colour, one specimen was observed to effect its change on the 8th of June, and produced the winged moth on the 21st of the same month, showing the duration of the pupa stage to be about thirteen days.

On examination the moth proved to be the *Phycita nebulo*, (Walsh) to which he has given the significant common name of "The Rascal leaf crumpler." In Mr. Walsh's excellent Report on the noxious insects of Illinois, he states that this larva affects the plum and wild crab as well as the cultivated apple. The young larvæ appear late in the summer, and construct their little cases, surrounded with portions of dried leaves, in which they pass the winter in a torpid state, awakening to activity and resuming their depredations as soon as the young foliage expands in spring. He was of opinion that this insect was confined exclusively to the North Western States, its occurrence in Canada shows that in this his views were incorrect. Although he had bred a number of specimens, he had never found them preyed on by any species of ichneumon fly, whereas in my own case, although I only bred seven or eight, one of them produced an interesting ichneumon, the name of which has not yet been determined.

The moth is a pretty little thing, its wings measure when expanded, about seven tenths of an inch. Its fore wings are pale brown, with patches and streaks of silvery white, the hind wings are plain brownish white, the under side of both wings is pale whitish brown, the hind wings paler than the fore wings. It is figured and described by Mr. Walsh, in the Proceedings of the Boston Society of Natural History, vol. 9 p. 312-3.

The amount of damage done by this insect in my own case was not great, their numbers were not sufficient to cause much alarm, but when they are very numerous, one can easily imagine, that their destructive powers would be very considerable, for besides consuming the foliage, their pernicious habit of gnawing away all the young bark from and about the spot to which the case is attached, would in all probability, lead sometimes to the girdling of the young branches, and their consequent death. The little bunch of dead and dried leaves around their cases, gives a ready means of detecting the presence of these little rascals, and no better remedy for them than hunting them up, and crushing the case with the hand, has yet been suggested.

From the Grape, Cidaria diversilineata.

Just as the grape blossoms were fully open, and while pinching in the rapidly growing branches of a seedling vine, a blossom bunch attracted attention by its unusual appearance. A closer inspection showed that parts of the bunch had been eaten away, and the remaining portions drawn together by light silken threads, and within the enclosure was a dull brown caterpillar, with its body much contracted, and just ready to assume the chrysalis state. The bunch was removed from the vine and enclosed in a small box, when in a day or two the change of form took place. The chrysalis was six-tenths of an inch long, and of a pale reddish brown color. In about ten days afterwards, it produced the perfect insect which proved to be *Cidaria diversilineata*. These observations disclose an interesting fact, regarding the history of this insect, that is, that it passes the winter occasionally, if not invariably, in the caterpillar state, hibernating in some secure retreat, where it sleeps peacefully, till called into activity again by the genial warmth of spring, when in a few days it finishes its growth, and effects its changes as already described.

This moth measures when its wings are expanded, $1\frac{1}{2}$ inches. Its color is pale ochre yellow, crossed by many greyish brown lines, and clouded also with patches of the same, particularly along the margin of the wings. The under side is a little paler than the upper, with fewer and fainter lines, but bordered along the outer edges, much the same as above. The body and legs are similar in color to the wings, the legs being marked with black about the joints.

On the 7th of June, a number of reddish geometric caterpillars, were found on the vine leaves, in which they had eaten innumerable holes of various shapes and sizes; these proved to belong to the same insect. At this time, they were about an inch long. The head was rather small, flattened in front and bilobed, each lobe projecting above and terminating in a point; color dull brownish green; mandibles tipped with reddish brown.

The body above was dull yellowish green, with a reddish or pink tinge, second segment pale yellowish green, smooth and very similar in appearance to the head, but larger, 3rd, 4th, 11th, 12th, and 13th segments, pale yellowish green, all the middle segments have a decided pinkish tinge, surface of body wrinkled. Terminal segment with two short greenish spines extending backwards over the anal lid.

The under surface was similar in color to the upper, with a double whitish line down the middle; feet pinkish; prolegs green.

Many variations in color were observed in different specimens of this larva. One which answered the descriptions given above on the 7th, changed its skin on the morning of the 8th, and appeared in a garb of very dark brown, nearly black, with longitudinal lines of paler brown. A younger specimen, was yellowish green, with the head very large and prominent. Another older one was bright, deep red above, with a wide, broken band of dull green down the middle of under surface, without any appearance of the double whitish line so prominent in most of the others. A fourth, about the same size, was dull whitish green, with the whitish lines below also wanting.

A full grown caterpillar found on the 10th of June, measured one and a quarter inches. Its head was dull reddish brown, the body above yellowish green as in former description, but with a few very small whitish dots on each segment. On each side of 2nd segment was a small reddish spot, and on the 3rd a larger one of a darker shade, on this latter segment the folds of the skin protrude, making the spot appear like a brown prominence. The spaces between the middle segments were yellowish, while two or three of the terminal rings were dull brown, in other respects, it answered to the previous description. The under surface had a reddish hue, a central dull reddish line, bordered on each side with a faint whitish stripe, edged again without by dull red; feet reddish, with the space between them yellowish green; prolegs reddish brown; spaces between bluish green. June 11th. This larvæ had now fastened itself up in a leaf, preparing for its next change.

I have taken fresh-looking specimens of this moth again on the wing during the middle part of the present month, August. They will probably deposit their eggs late in the month, producing larvæ which will attain to nearly the full growth before winter, and hybernating during the cold season, resume their destructive labors with the opening spring.

As a remedy when their numbers are great, syringing the vines with hellebore and water would probably serve a good purpose. They are not confined to the vine, but are found also on the Virginia creeper, *Ampelopsis quinquefolia*.

NOTES ON THE LARVA OF OPHIUSA BISTRIARIS, *Hubner*.

BY W. SAUNDERS, LONDON.

Late in July a number of specimens of a larva apparently allied to the genus *Catocala* were taken from the silver maple (*Acer dasycarpum*, Ehrh.). The description of this larva is as follows :

Length 1.40 inches ; somewhat oniseiform.

Head medium sized, flattened, bilobed ; color pale ashen grey, with streaks of pale brown appearing under a magnifying lens as a fine network ; a dark brown, nearly black, stripe on each side, and a few short grey hairs scattered over its surface.

Body above brownish-grey, with numerous streaks and dots of pale brown. A double irregular dorsal line, widening here and there throughout its entire length. There are many other broken lines of the same character, composed chiefly of dots, but none of them continuous. A sub-dorsal row of whitish dots, composed of two or three on each of the middle segments, less numerous on anterior segments ; a few pale grey hairs placed chiefly along each side below spiracles. On the hinder part of 12th segment is a raised crescent-shaped line edged behind with black, and on the terminal one two whitish dots with a small patch of black at their base. Spiracles pale, oval, edged with black.

Under surface paler and greenish, quite bluish-green from seventh to eleventh segments, with a round central blackish spot on hinder part of seventh and eighth. Anterior pair of prolegs present but dwarfed, and not used in progression ; body slightly arched with each forward movement. Feet greenish, semi-transparent ; prolegs bluish-green dotted with brown.

This larva is subject to considerable variation in its color and markings.

Var. A.—Body paler in color. Head pale, with lines very much less distinct. The black edging of raised line on 12th segment scarcely apparent.

Var. B.—Body dark-red, with markings similar to those of the usual grey variety.

Var. C.—Body dark brown, nearly black. Head larger, with markings prominent.

When about to go into chrysalis this larva cuts through a portion of a leaf of the tree on which it has fed, and turning it over constructs a snug little case, fastening it up closely and carefully with silken threads, and in this completes its transformations. After remaining in the pupa state about two weeks the imago appeared, which proved to be *Ophiusa bistriaris*.

LIST OF COLEOPTERA,

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from page 118.)

SPHINDIDÆ.

**Sphindus Americanus*, *Lec.*

CIOIDÆ.

Cis fuscipes*, *Mellie.*Ennearthron mellyi*, *Mell.***Ceracis militaris*, *Mell.*

TENEBRIONIDÆ.

Phellopsis obcordata, *Lec.**Blapstinus metallicus*, *Lec.**Centronopus calcaratus*, *Fab.***Merinus lævis*, *Oliv.**Xylopinus saperdoides*, *Oliv.**Haplandus femoratus*, *Fab.**concolor, *Lec.**Nyctobates Pensylvanica*, *De Geer.***Iphthinus opacus*, *Lec.**Tenebrio molitor*, *Linn.*castaneus, *Knoch.*tenebrioides, *Beauv.**Paratenetus punctatus*, *Spin.***Tribolium madens*, *Charp.**Uloma impressa*, *Mels.**culinaris, *Linn.**mentalis, *Horn.**Boletotherus cornutus*, *Fab.**Boletothagus corticola*, *Say.***Rhipidandrus flabellicornis*, *Lec.***Pentaphyllus pallidus*, *Lec.**Diaperis hydni*, *Fab.**Haplocephala bicornis*, *Oliv.**Platydemia excavatum*, *Dej.*Americanum, *Lap.**picilabrum, *Mels.*flavipes, *Fab.**Hypophloeus parallelus*, *Mels.**thoracicus, *Mels.*¹**Dicædus punctatus*, *Lec.**Helops micans*, *Fab.**Meracantha contracta*, *Beauv.***Strongylium tenuicollis*, *Say.*

CISTELIDÆ.

Allecula nigrans, *Mels.***Hymenorus obscurus*, *Say.*niger, *Mels.**Cistela brevis*, *Say.*sericea, *Say.**Isomira quadristriata*, *Couper.**velutina, *Lec.***Mycetocharis foveatus*, *Lec.**tenuis, *Lec.*binotata, *Say.***Chromatia amœna*, *Say.**Capnochroa fuliginosa*, *Mels.**Androchirus luteipes*, *Lec.*

LAGRIIDÆ.

Athromacra aenea, *Say.*

PYROCHROIDÆ.

Pyrochroa flabellata, *Fab.*femoralis, *Lec.**Schizotus cervicalis*, *Newm.**Dendroides concolor*, *Newm.*Canadensis, *Latr.*

ANTHICIDÆ.

Corphyra collaris*, *Say.*lugubris, *Say.*newmani, *Lec.Notoxus anchora*, *Hentz.***Anthicus obscurus*, *Ferte.*

* Species marked with an asterisk have not before been included in the list of Canadian Coleoptera.

¹ Three specimens taken by Dr. Milward.

Anthicus formicarius, *Ferte*.

**floralis*, *Payk*.

scabriceps, *Lec*.

cervinus, *Ferte*.

**coracinus*, *Lec*.

**Xylophilus piceus*, *Lec*.

**fasciatus*, *Mels*.

MELANDRYIDÆ.

**Cænifa pallipes*, *Mels*.

Tetratoma truncorum, *Lec*.

Stenotrachelus arctatus, *Say*.²

Penthe obliquata, *Fab*.

pimelia, *Fab*.

Synchroa punctata, *Newm*.

Emmesa connectens, *Newm*.

Melandrya striata, *Say*.

**Xylita lævigata*, *Hel*.

Spilotes quadripustulosus, *Mels*.

Hypulus simulator, *Newm*.

Serropalpus striatus, *Hel*.

Enchodes sericea, *Hald*.

Dircæa liturata, *Lec*.

**Symphora flavicollis*, *Hald*.

**rugosa*, *Hald*.

Hallomenus scapularis, *Mels*.

Eustrophus bicolor, *Fab*.

bifasciatus, *Say*.

tomentosus, *Say*.

Orchesia gracilis, *Mels*.

MORDELLIDÆ.

**Anaspis nigra*, *Hald*.

flavipennis, *Hald*.

rufa, *Say*.

**Tomoxia inclusa*, *Lec*.

Mordella melæna, *Lec*.

scutellaris, *Fab*.

**octopunctatus*, *Fab*.

marginata, *Mels*.

Mordella lineata, *Mels*.

**serval*, *Say*.³

triloba, *Say*.

**Mordellistena lutea*, *Mels*. ?

trifasciata, *Say*.

**limbalis*, *Mels*.

**ornata*, *Mels*.

scapularis, *Say*.

**tosta*, *Lec*.

**varians*, *Lec*.

**morula*, *Lec*.

**unicolor*.⁴

**divisa*, *Lec*.

**liturata*, *Mels*.

**discolor*, *Mels*.

Pelecotoma flavipes, *Mels*.

MELOIDÆ.

Meloe angusticollis, *Say*.

Macrobasis Fabricii, *Lec*.

Epicauta Pensylvanica, *De Geer*.

vittata, *Dej*.

CEPHALOIDÆ.

Cephaloon lepturides, *Newm*.

CEDEMERIDÆ.

Asclera ruficollis, *Say*.

puncticollis, *Say*.

MYCTERIDÆ.

Mycterus scaber, *Hald*.⁵

PYTHIDÆ.

Pytho Americanus, *Kirby*.

**strictus*, *Lec*.

Boros unicolor, *Say*.

**Rhinosimus nitens*, *Lec*.

SCOLYTIDÆ.

**Crypturgus atomus*, *Lec*.

**Cryphalus fasciatus*, *Say*.

**mali*, *Fitch*.

**materiarius*, *Fitch*.

² A single specimen, taken on the Lake Shore.

³ Taken in the Township of Adelaide

⁴ Taken in Bosanquet.

⁵ A single specimen taken by Dr. Milward.

- | | |
|--|--|
| * <i>Cryphalus pullus</i> , <i>Zimm.</i> | * <i>Micracis suturalis</i> , <i>Lec.</i> |
| * <i>puberulus</i> , <i>Lec.</i> | * <i>aculeatus</i> , <i>Lec.</i> |
| * <i>Xyloterus retusus</i> , <i>Lec.</i> | * <i>Chramesus hicoriae</i> , <i>Lec.</i> |
| <i>politus</i> , <i>Say.</i> | * <i>Phlorotribus limniaris</i> , <i>Harr.</i> |
| * <i>Xyleborus pyri</i> , <i>Harr.</i> | <i>Hylesinus aculeatus</i> , <i>Say.</i> |
| * <i>pubescens</i> , <i>Zimm.</i> | * <i>opaculus</i> , <i>Lec.</i> |
| * <i>sparsus</i> , <i>Lec.</i> | <i>dentatus</i> , <i>Say.</i> |
| * <i>plagiatus</i> , <i>Lec.</i> | <i>Dendroctonus terebrans</i> , <i>Lec.</i> |
| * <i>cælatus</i> , <i>Eich.</i> | * <i>simplex</i> , <i>Lec.</i> |
| <i>Tomieus calligraphus</i> , <i>Germ.</i> | * <i>Hylastes porculus</i> , <i>Er.</i> |
| * <i>cacographus</i> , <i>Lec.</i> | <i>pinifex</i> , <i>Fitch.</i> |
| <i>pini</i> , <i>Say.</i> | |

MISCELLANEOUS NOTES.

REARING BUTTERFLIES FROM THE EGG.—In the last number of the *Canadian Entomologist* I mentioned that I had succeeded in inducing females of *P. ajax* to deposit eggs, by enclosing them in a keg placed over the growing food-plant—the paw-paw. The first female enclosed on May 16th laid a number of eggs, and another female was enclosed in the same keg on the 17th. I was obliged to leave home for some days, and returned on June 1st, when I found but six larvæ in the keg. These had hatched and attained a length of three-fourths of an inch within sixteen days. On the 5th of June the larvæ were mature and had stopped feeding; the whole time from the laying of the eggs being but three weeks. On the 20th one ♂ *Marcellus* emerged; on the 21st a ♀ *Marcellus*, and by the 23rd four others emerged, all *Marcellus*.

On the 1st of June I put three ♀ *Ajax* into another keg; by the 2nd 37 eggs were deposited. These began to hatch on the 6th. From this lot I obtained 24 chrysalids, which began to give imagos by 3rd of July. From them I obtained 12 ♂ and 10 ♀, all *Marcellus*.

On June 7th I shut up a ♀ *Marcellus*, the first I had noticed flying this year. By the 23rd I had five larvæ from this lot. The imagos began to appear on the 4th of July, and gave three ♀ and one ♂, all *Marcellus*, not distinguishable from those produced from the eggs of *Ajax* as above.

So that the question of the identity of *Ajax* and *Marcellus* may be regarded as settled.

I have had no difficulty, by some means, in inducing other species to deposit eggs. On a young tulip tree I placed two black females of *Turnus* (*Glaucus*), and have now several larvæ growing as the result. I have also raised two broods of *C. Philodice*, and the *Nisoniades lycidas*, and *N. pylades*, Scudder.

It is necessary in these experiments to watch carefully for small spiders, who very soon discover the eggs and devour them remorselessly.—W. H. EDWARDS, Coalburgh, West Va.

FOOD-PLANT OF *DARAPSA VERSICOLOR*.—I enclose leaves of the plant on which the larvæ of *D. versicolor*, Harris, the rarest of our Sphingæ, feed. It is a swamp plant, common in the vicinity of Brooklyn, N. Y.—W. H. EDWARDS.

[The plant has been kindly determined by Prof. Macoun to be *Cephalanthus occidentalis* (the Button Bush). It is, he states, a shrub growing on mud flats or along the low banks of streams; its leaves are opposite or in whorls of three leaves; its flowers are white growing in round heads about an inch across—hence the name.]

COLORADO POTATO BEETLE.—In addition to the localities mentioned in our last number, we have received a specimen of this destructive insect from Mr. N. H. Cowdry, Stratford, Ont., which was found there "on the sidewalk in a very mutilated condition." Mr. Saunders has received specimens from Sarnia, and has heard of its being found at Amherstburg. The last number of the *American Entomologist* mentions that it has been found also at Point Edward, the extreme southern end of Lake Huron. If prompt action be not taken by the farmers in the western section of the country, we shall soon, we fear, have to chronicle its spread over the whole of our country.

NOTE ON A HABIT OF CERTAIN INDIAN COLEOPTERA.—The Rev. A. B. Spaight, late Missionary to Northern India, has informed me of a fact frequently observed by him at Moulton, and which has, I believe, acquired additional interest from the circumstances of its being a disputed point amongst Naturalists.

It appears that certain large beetles belonging to the *Lucanidæ* and *Longicornia* are said to saw off small branches from trees in order to get at the sap upon which they feed. Mr. Spaight (who only began to study the habits of insects after he had left England) arrived in India under the impression that the jaws of these large beetles (*Lucanidæ*?) were solely intended for burrowing,—indeed, he had been told almost as much; what was his surprise then, upon first meeting with them in their native haunts, to see the huge jaws clasping a branch round which at the same time the beetle was rapidly whirling, so that in a short time the branch fell to the ground completely sawn through; whereupon the insect immediately set to work to suck up the sap!

Being struck with this apparently new fact, Mr. Spaight paid particular attention to it, and noticed the same thing over and over again, so that he is

quite sure about the correctness of his observations.—A. G. BUTLER, in the *Entomologist Monthly Magazine*.

MIMICRY.—At a recent meeting of the Entomological Society of London, England, the President read the following extract from a letter, dated "Sarawak, 17th April, 1870," from Mr. A. Everett:—

"My brother has found two remarkable spiders. One, which we had not the means of keeping at the time, was lying with its legs pressed closely beside its body, and was white streaked with black in irregular fashion: when he called me to see it, I looked closely but in vain for it, the only thing visible on the leaf being apparently a patch of bird's dung; when it moved, one saw immediately what it was. The other is similar in colour and behaviour, but seems to belong to a different genus, and the resemblance to the droppings of a bird is not so completely deceptive. These would appear to be instances of protective mimicry, and as such will perhaps be of interest to you. I have another example, almost if not quite as evident: I had a caterpillar brought me, which, being mixed by my boy with some other things, I took to be a bit of moss with two exquisite pinky-white seed-capsules; but I soon saw that it moved, and examining it more closely found out its real character: it is covered with hair, with two little pink spots on the upper surface, the general hue being more green: its motions are very slow, and when eating, the head is withdrawn beneath a mobile fleshy hood, so that the action of feeding does not produce any movement externally; the shape is oval, and the edges are fringed with tufts of hair: it was found in the limestone hills at Busan, the situation of all others where mosses are most plentiful and delicate, and were they partially clothe most of the protruding masses of rock: I placed it in spirit, but it has become shrunken and turned to a dirty yellowish colour. Such things, however, require to be seen alive in order to properly appreciate the close resemblance they bear to the particular objects they resemble."

Mr. De Grey mentioned that he had often been struck by the resemblance of the caterpillar of *Melitæa Cinxia* to the flower of the plantain upon which it feeds, whilst the pupa resembled the seed of the same plant.

The Secretary exhibited a large woolly gall of the oak and a number of living specimens of *Cynips ramuli* which had emerged therefrom. The gall was found on the 24th of June, at Idsworth, near Horndean, by Sir. J. Clarke Jervoise, Bart., who wrote respecting it as follows:—

"My attention was yesterday called to what I thought was a ball of sheeps' wool in a meadow where there were no sheep, and I placed it under a glass clock-shade for security. This morning I found the clock had stopped, and a quantity of flies were in the case and in the works of the clock. I never happened to have seen a similar growth on the oak, a sprig of which is visible

in the woolly gall, and I have sent some of the flies in spirits. There are more hatched out in the box since I placed the oak-gall in it." How many specimens of the *Cynips* hatched in the clock-case did not appear, but the box exhibited was found to contain upwards of eighty.—*Zoologist*.

DEATH OF PROF. LACORDAIRE.—We learn with regret that death has claimed the greatest of modern Coleopterists. Prof. Lacordaire died at Liège on the 18th July, in his 70th year.

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AGENTS FOR THE CANADIAN ENTOMOLOGIST.

CANADA—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P. Q.; G.

J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y.

Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, N. Y.

ENGLAND.—Wm. Wesley, 81 Fleet Street, London, E. C. Subscription 5s. per Vol.

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The Canadian Entomologist.

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TO OUR SUBSCRIBERS.

During the last few months the Editor and his valued contributors, Messrs. W. Saunders and E. Baynes Reed, have had the little leisure they are wont to devote to Entomology, so completely engrossed with the preparation of a Report on some of the Noxious Insects of Canada, for the Agricultural and Arts, and the Fruit Grower's Associations of Ontario, that it has been quite out of their power to issue a number of the *Canadian Entomologist*. In order to make some amends for this delay, we now issue a double number, and hope—we no longer venture to promise—to publish the closing number of the volume in a few weeks. We shall be glad to receive contributions from our friends in all quarters, and to obtain promises of aid for our *third* volume.

EXTRACT FROM A REPORT ON THE PLUM CURCULIO,

(*Conotrachelus nenuphar*.)

BY W. SAUNDERS, LONDON, ONT.

Read before the Meeting of the Fruit Growers Association of Ontario, held in London, June, 1870.

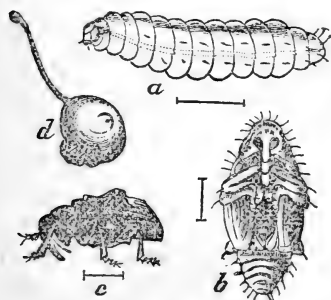


FIG. 8.

The accompanying figure shows the curculio in all its stages. *a*, is the larva, *b*, the chrysalis, *c*, the perfect beetle, all magnified, the adjoining lines show the natural size, *d*, is a small plum with the curculio (natural size) working on it. One egg is deposited under the crescent cut, and a second incision is being made.

I shall now refer to some experiments of my own on this insect which will, I hope, add something to our knowledge of the creature's habits. I had seen it stated somewhere that the curculio was

active at night, and I had also seen the idea ridiculed, and being somewhat sceptical on the point, resolved to test it. Accordingly I went out about midnight with lantern and sheet, and on jarring one tree down came two curculios, and from another tree one. When they drop to the ground from jarring in the day-time they usually remain motionless for a good while, feigning death. But there was no shamming about these creatures taken at this time of night, for they commenced to run about at once on the sheet, and fearing they would fly they were quickly transferred to a pill box. They were then taken into a room where there was a lamp burning, when on opening the box one of them at once took wing attracted by the lamp, and flew around the light. Thinking this activity might be due in part to the stimulus of a bright light, I placed them in a dark room for a while, and then approached them with the faintest glimmer of light, just enough to enable me to see them, when I observed them running about very quickly, faster than I have seen them move in bright daylight. This ended the experiments for that time, and the insects were closely shut up in a box for safety.

The next night the operation was repeated, and two curculios taken from one tree as before. These manifested just the same symptoms of activity as their predecessors, and along with them (now five in all) they were put into a box having a glass lid, with a small branch from a plum tree having five plums on it, each one of which had been carefully examined and found quite free from puncture or bite of any sort. The box was placed in a darkened room and covered with a black cloth so arranged that no light could possibly penetrate until its removal. Early in the morning the cloth was suddenly taken away and two of the curculios were found working on the plums, while the others were quiet or leisurely walking around in other parts of the box. The branch was at once taken out and examined: plum No. 1 had a puncture at the tip, hollowed out so that the skin was getting black; No. 2 was in the same state with a second large puncture in the side; No. 3 had two punctures on the tip, one large and one small one; No. 4, a small puncture near the base of the stem, while in No. 5 four eggs were deposited, and it was also punctured in four places, one of the punctures being very large, deep, and crescent shaped, a second quite shallow, barely through the skin. I observed that they were much less active in the morning than at night.

Being anxious to see how they would do their work in the day-time, another branch was cut with sound plums on it a little before noon and placed in the box with the same insects. When exposed to the sunlight they were nearly as active as in the night, occasionally flying around the box inside. They were left exposed under a slight shade afforded by a small tree

and examined at noon, when it was found that two eggs had been deposited, this was within an hour from the time of their exposure. Again it was examined early in the evening, when the number of eggs deposited had increased to nine, and a great many punctures had been made on different parts of the fruit where the curculios had been feeding.

These experiments I think clearly prove that they work in the dark as well as in the light, feeding and depositing eggs at night as well as in the daytime—that is during the warmer parts of the season, for it should be observed that at the time I operated the nights were quite warm.

With regard to the best time for jarring, experience leads me to believe that the evening is preferable, provided the work is not undertaken too early, say about sunset, or if it is done in the morning the earlier the better. I will give you a little incident connected with evening jarring. Having just observed a curculio drop on the sheet where I was at work, and having a few minutes to spare I resolved to watch to see how long the creature would feign death. For half an hour a careful scrutiny was kept up, during which time it did not move a muscle. How long it would have continued in this state is uncertain, as I had no more time to devote to the experiment; just then an attempt was made to pick the curculio up, when, as soon as it was touched, it began to run vigorously. While watching this specimen another was observed on a low outer branch of the same tree which the slight previous jarring had failed to bring down. It remained quite still for a good while on the branch, then walked a few steps, stopping a while again, and so on, during the half hour it did not progress more than two inches in all. An attempt was now made to see if shaking would bring it down on the sheet. Beginning lightly the shaking was increased in rapidity every time until it became quite violent, much more so than any large tree could be shaken, but it maintained its hold on the limb and became more active between the intervals of shaking. Being satisfied that shaking would not do, jarring was tried, when a single tap brought it to the ground.

ON NEONYMPHA EURYTHRIS, FAB.

BY W. SAUNDERS, LONDON.

This butterfly appeared earlier than usual with us this year. It is not seen on the wing sooner than the 10th or 12th of June, but this season they were tolerably common as early as the 1st, and probably had been then flying for several days. They delight in the sunny openings found oftentimes in partially cleared woods, also in wooded lanes and roads and the sunny edges of the forest, where by their peculiar jumping flight they may be readily recognized, sometimes singly, at other times sporting in twos and threes.

For the first few days the specimens captured will be found to be nearly all of the male sex, but after this the females begin to appear and both sexes are found together during the remainder of their short season of life which does not usually extend beyond the first week in July. Sometimes an odd specimen may be taken later than this, but it is always battered and worn, as if the protraction of its life beyond the usual time had been attended by many struggles and fightings.

On the 4th of June, 1870, we enclosed a captured female in a pill box for the purpose of obtaining eggs. The box was not examined till the 7th, when several eggs were found attached to its sides. The length of the egg was 3-100ths of an inch. It was nearly globular in shape, flattened a little at the place of attachment. Its color was pale yellowish green and it was covered with a very fine network, the spaces between the meshes being slightly depressed.

The young larva hatched on the 19th and 20th. The box was not examined on the 19th, and when looked into on the 20th, several of the young creatures were too much weakened for want of food to recover. There were two or three which promised well, but after the first few days only one survived, which has been watched over with much care and fed on grass.

Description of the larva fresh from the egg.—Length, $5\frac{1}{2}$ -100ths of an inch. Head very large, dark brown with a few yellowish hairs.

Body above dull whitish, with a dorsal and three lateral stripes of pale red, on each segment are a number of thick, short hairs or small spines, each arising from a minute tubercle and tipped with a small rounded knob. Under surface whitish, semi-transparent, feet and legs the same.

No description of this insect was taken between the first and second moultings, but after the second moult, July 20th, the following notes were taken:

Length .35 inch. Anterior segments nearly cylindrical, posterior onisci-form. Head medium size, larger than second segment, flat in front, with a flattened ridge above; color pale greenish, with a black dot on each side and a number of pale brown dots arranged nearly in transverse rows, and thickly covered with very short whitish hairs springing from small bulb-like tubercles; mandibles dark brown.

Body above greenish grey, thickly covered with small whitish tubercles similar to those on head, from each of which arises a single short brown or reddish brown hair; a reddish brown dorsal stripe, and a faint sub-dorsal line of the same on which is a row of dots of a similar color but of a little darker shade, most distinct on middle segments; there is also a stigmal band of the same, edged below with yellowish green, and a second faint

lateral line between the sub-dorsal and stigmatal, the latter most distinct on anterior segments; terminal segment forked.

Under surface pale whitish green, feet and prolegs greenish, semi-transparent.

Its growth was very slow for the next two months after which it ceased growing, becoming semi-torpid, eating a very little occasionally for a short time longer, and then it settled down for a lengthened fast which no morsel however green and dainty would tempt it to break. No perceptible change has taken place in its appearance up to the present, December 31, and will not we presume, until the warmth of spring infuses new life into it. The following description was taken a few days since.



Figure 9.

Length half an inch—onisciform (see figure 9). Head large; bilobed, with each lobe slightly pointed above, appearing almost square when

viewed from the front. Color yellowish brown, thickly covered with granulations of the same from which arise short brownish hairs visible only with a magnifier; there are two or three small black dots on each side, one larger than the other; mandibles tipped with black.

The body above is a little paler in color than the head, of a uniform pale brownish yellow throughout entirely covered with like granulations emitting also short brownish hairs. The second segment is constricted, giving the head a much more prominent appearance than it would otherwise have; it is also free from granulations on its anterior edge not observable when the larva is at rest; but when in motion this smooth edge appears, of a paler hue than the general color and sprinkled with a few black dots. The body is thickest from seventh to tenth segments, and there is a faint dorsal line of a darker shade most apparent on the posterior segments; terminal joint forked; stigmata small, nearly round, and black.

The under surface is similar in color and appearance to the upper, with a ventral row of faint brownish dots; feet and prolegs tipped with brown.

From the facts thus gathered, we can give a short summary of the history of this species. The butterfly appears from the 10th to 25th of June, depositing its eggs singly—fastened on blades of grass—from the middle to the last of the month. Duration of the egg stage, from ten to thirteen days. The larva is then hatched and continues growing until September, when having attained the length of about half an inch, it looks out for a hiding place in which to pass its long wintry sleep. The early spring calls it again to activity, when it begins to feed at once on the young and tender grass, completing its growth probably during the second or third week in May when

it becomes a chrysalis, from which the butterfly appears, to commence afresh the circle of existence. In all probability our other two species belonging to this family—*Boisduvalii* and *Nephele*—have a similar history although they appear later in the season.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 110.)

51. *AMARA VULGARIS*, Latr.—Length of body 4 to 4½ lines. Many specimens taken in lat. 65°, and in the Rocky Mountains.

Body black, glossy; above black-bronzed. Scape of the antennæ piceous; inner lobe of the maxillæ, and first joint of the outer palpi, testaceous; basilar impressions of the prothorax double, deepish, impunctured, the external one oblique; channel abbreviated anteriorly, with a punctiform impression beyond the middle: furrows of the elytra lightly drawn, indistinctly punctured; apex subacuminate or suddenly narrowed: legs black, with the hairs, spurs and claws testaceous.

Variety B. Bright, bronzed with a cupreous tint.

C. Wholly black.

[An European species, unknown to Dr. LeConte. Stated by Mr. William Couper—but probably erroneously—to be common at Toronto.—*Can. Jour.* 1855, p. 256.]

[39] 52. *AMARA INÆQUALIS*, Kirby.—Length of body 4 lines. Several taken in lat. 54°.

Very like *A. vulgaris*, but the two first joints of the antennæ are rufous; the basilar impressions of the prothorax are not so deep; and the interstices of the furrows of the elytra are convex and uneven: in other respects there is little difference between them. [Previously described as *A. interstitialis*, Dej.; taken, according to Dr. LeConte (*Pro. Acad. Nat. Sci., Phil.*, June, 1855, p. 353), on Lake Superior, at Fort Simpson, Mackenzie River, and in Massachusetts, Pennsylvania and Illinois. Also found at Grimsby, and other places in Ontario.]

53. *AMARA IMPUNCTICOLLIS*, Say.—Taken in lat. 54°. [Common in Canada; for description *vide* Say's Ent. Works, ii. 463.]

54. *AMARA PALLIPES*, Kirby.—Length of body 3 lines. Only one specimen taken.

Body glossy; underside, mandibles, coxæ and tarsi piceous; upperside bronzed. Three first joints of the antennæ rufous; frontal impressions very

slight, connecting line very distinct: dorsal channel of the prothorax nearly entire; basilar impressions rather punctiform, punctured; elytra not subacuminate: legs yellowish. [Taken on Lake Superior and in Northern New York, according to LeConte; also in Ontario.]

[40] 55. *AMARA LAEVIPENNIS*, Kirby.—Length of body $3\frac{1}{2}$ lines. Three or four specimens taken in lat. 54° .

Body glossy; the underside, legs and antennæ black; upperside black-bronzed: frontal impressions very slight: prothorax smooth, with the basilar impressions very faint: furrows of the elytra very lightly drawn, and sometimes subinterrupted; intermediate trochanters piceous. ["Lake Superior, one pair; a female from Massachusetts, sent by Dr. Harris" (LeConte).]

56. *AMARA DISCORS*, Kirby.—Length of body 4 lines. One specimen only taken.

This species has somewhat the aspect of a *Harpalus*, but it exhibits the true characters of *Amara*: it appears to be related to *A. discrepans*, Stephens. Body dark piceous, glossy. Upper-lip, palpi, mouth and antennæ ferruginous: prothorax a little narrowed behind; bead of the lateral margin rufous; basilar impressions rather slight: elytra less glossy than the rest of the body, the infinitely minute and numerous granular reticulations of their substance being more conspicuous than usual; the furrows of the elytra from minute punctures exhibit a slight appearance of crenulations: legs pale chestnut. [Unknown to Dr. LeConte; the student of the *Amaræ* is referred to his paper on this genus in the Pro. Acad. Nat. Sci. Phil., June 1855, p. 346, for much valuable matter and fuller descriptions.]

[41] 57. *HARPALUS PLEURITICUS*, Kirby.—Taken frequently in lat. 54° . [For description *vide* Mr. Sprague's *Carabidæ*, CAN. ENTOM. ii. p. 96. Taken in Ontario and, according to Dr. LeConte, in Minnesota and Winnipeg.]

58. *HARPALUS BASILARIS*, Kirby.—Length of body 4 lines. Taken with the preceding, and in equal numbers.

This species differs from the preceding, which it nearly resembles, in having the two first joints of antennæ yellow, and the remainder dusky; in having the prothorax still wider in proportion to its length, with its posterior angles more acute and impunctured, and with narrower basilar impressions also without punctures; its lateral margin is also black and less prominent: the side-covers of the elytra are likewise black: the legs are dark-piceous, with yellowish-red trochanters. In other respects it resembles *H. pleuriticus*. [Unknown to Dr. LeConte.]

[42] 59. *HARPALUS OCHROPUS*, Kirby.—Length of body $3\frac{1}{2}$ lines. [No locality stated.]

This comes very near *H. pleuriticus*, but is considerably smaller; the antennæ are longer; the prothorax is impunctured at the base, its basilar impressions are linear; the side-covers of the elytra are chesnut; and its thighs are more robust in proportion. [Unknown to Dr. LeConte; supposed by him to be perhaps *H. desertus*, Lec.]

60. *HARPULUS INTERPUNCTATUS*, Kirby.—Plate vii. fig. 8.—Length of body $5\frac{1}{2}$ lines. Many taken in lat. 54° .

Body proportionally longer than in the antecedent species, black, glossy, not depressed. Head triangular, with a pair of confluent red dots, visible only in the sun, between the eyes; antennæ shorter than the prothorax, with the scape and last joint of the palpi rufous: prothorax subquadrangular; anterior angles rounded; dorsal channel drawn from the apex to the base; punctured especially posteriorly, disk impunctured, transversely wrinkled; basilar impressions shallow; lateral margin dilated posteriorly; elytra rather deeply furrowed, furrows impunctured, interstices convex, very minutely but not thickly punctured: the four anterior tarsi of the male are furnished with a thick brush of vesicles, not arranged in a double series, as in other species of this genus. [Placed, with a mark of interrogation, in LeConte's List, as a synonym of *Anisodactylus melanopus*, Hald., a species taken in Canada.]

[48] 61. *HARPALUS LONGIOR*, Kirby.—Length of body $5\frac{1}{4}$ to $7\frac{1}{2}$ lines. Two specimens taken, the largest in lat. 54° .

Body black. Upper-lip piceous; antennæ, palpi and legs reddish-tawny, the first longer than the prothorax; the nose terminates anteriorly in a reddish membrane or rhinarium: prothorax quadrangular with all the angles rounded, rather longer than wide; dorsal channel anteriorly abbreviated; lateral margin minutely punctured, much depressed, especially at the posterior angles; basilar impressions double, shallow, and minutely punctured; elytra very little glossed, more than twice the length of the prothorax, furrows impunctured with convex interstices, the lateral ones with some scattered very minute punctures; the vesicles on the sole of the four anterior tarsi of the male are arranged as in the other *Harpali*.

Both the specimens taken in the expedition are males, or I should have supposed the unusual difference in their size was sexual: probably the small one was taken in a higher latitude. [Unknown to Dr. LeConte; thought by him to be perhaps *H. vagans*, Lec.]

62. *HARPALUS LATICOLLIS*, Kirby.—Length of body $5\frac{1}{2}$ lines. A single specimen taken.

This insect very closely resembles *H. interpunctatus*; it differs principally in having a rather wider prothorax with all the angles rounded, with the dorsal channel abbreviated anteriorly, and with only the base very indistinctly

punctured; the interstices of the furrows of the elytra are also without punctures, and there is a single punctiform impression in the usual situation adjacent to the second furrow. [Previously described as *Anisodactylus nigerrimus* by Dejean.]

[44] 63. *HARPALUS* [*ANISODACTYLUS*] *CARBONARIUS*, Say.—Two specimens taken in lat. 54°. [Taken also in Canada; for description *vide* Say's Ent. Works, ii. p. 460.]

64. *HARPALUS* *ROTUNDICOLLIS*, Kirby.—Length of body 5½ lines. Two specimens taken.

Body brownish, black, glossy. Antennæ length of the prothorax, as well as the tip of the palpi, rufous: prothorax wider than long, with rounded angles; basilar impressions shallow, round and punctured: the elytra exhibit a silky lustre from the granulations on the surface; there is a single punctiform impression in the usual situation near the apex; in this and the following species these organs are transversely truncated with a slight sinuosity; legs rufous or rufo-piceous, with black thighs; coxæ and trochanters rufous. [A variety, according to LeConte, of *H. amputatus*, Say (Ent. Works, ii. 546), a species taken in "Kansas, New Mexico, Saskatchewan, Montreal, Canada."]

[45] 65. *HARPALUS* *STEPHENSII*, Kirby.—A single specimen, taken in lat 54°. [A synonym of *H. amputatus*, Say.]

[46] 66. *STENOLOPHUS* *VERSICOLOR*, Kirby.—Length of body 2½ to 2¾ lines. Three specimens were taken in lat. 54°.

Body dusky-black, glossy. Palpi, mouth and scape of the antennæ rufous; prothorax scarcely longer than wide, rounded behind, with the basilar impressions punctured: elytra reddish-brown,—viewed in the sun or in the light, they exhibit a changeable tint of violet; a punctiform impression adjoins the second furrow; apex slightly sinuated; epipleura yellow: thighs dusky, especially the posterior pair, which are larger than the others; tibiæ and tarsi rufous.

The female has less of the violet tint, and the elytra are of a pale mahogany colour.

Variety B. With the two first joints of the antennæ rufous; legs yellow. [Previously described as *S. fuliginosus* by Dejean; is taken in Ontario.]

ON THE LARVA OF *DIPHTHERA DERIDENS*, Guénee.

BY W. SAUNDERS, LONDON, ONT.

A single specimen of the larva of this insect was taken crawling on a fence on the 1st of October, 1866. It must be very rare in this locality as I had never seen it before, nor have I observed it since, nor ever captured a specimen of the imago, which is very handsomé. Food plant unknown.

Length 1·20 in. cylindrical.

Head medium sized, rather flat, slightly bilobed, of a pale greenish-white color, with a large patch of black on each lobe above and a smaller one below just above mandibles. Mandibles black, with a streak of white on each.

Body above pale greenish-white, semi-transparent, with transverse rows of tubercles of the same color, from which arise tufts of long, fine, silky, white hairs. On second segment the hairs overhang the head, and there are here one or two black ones on each side mixed with the white. A dorsal line of pale green; stigmata pale white, edged very faintly with pale reddish.

Under surface, feet and prolegs of the same color as upper surface.

The larva entered the chrysalis state shortly after its capture, and produced the imago on the 11th of June, 1867.

ENTOMOLOGICAL GLEANINGS.

PAPER NO. III.

BY W. SAUNDERS, LONDON, ONT.

THE CURRANT WORM IN TROUBLE.

On the 21st of July at a quarter past seven in the evening we were passing around among the currant and gooseberry bushes watching the manipulations of a few of those well known foes, the larva of *Nematus ventricosus*. The accompanying figure will illustrate their appearance and doings; they were feeding away voraciously with perennial appetites, when a disturber of their peace appeared among them in the shape of a small black ichneumon fly which fastened itself on the body of one of their number, and began to deposit its eggs by means of a sharp ovipositor, dexterously thrust through the skin of its victim, whose jerks and writhings while indicating a very uneasy state, failed to shake off the tormentor. The fly remained some time attached and so intent was



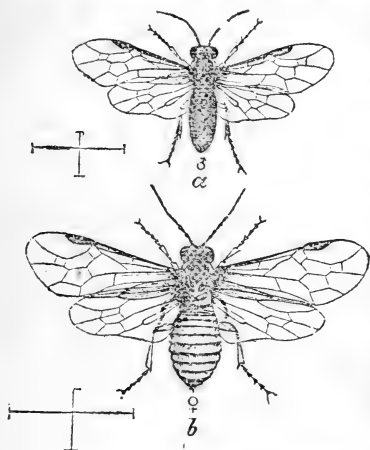
it in fulfilling the instincts of its nature that a capture was made of both fly and larva, by the sudden movement of a pill box, but while endeavouring to transfer them to the inside of a tumbler so that their further operations might be better observed, the fly suddenly escaped and was seen no more; the larva also died before reaching maturity, so that its further history could not at that time be developed.

NEW FOOD PLANTS.

A few days after this and about the end of the month we were not a little astonished at finding a colony of the worms about a quarter of an inch long feeding on the leaves of the black currant which we had previously supposed to be entirely exempt from their attacks. These were collected and fed on black currant leaves until about half grown, when they sickened and died. On the 7th of September a smaller number were found feeding on the leaves of a plum tree, taken and watched in the very act, the leaves were partially eaten all around them, and the worms about half grown. These were also taken and fed in confinement on plum leaves which they ate very well for several days, but from some cause they all died before maturity, whether from confinement, or the unsuitable character of the food it would be difficult

to determine. From the position of the leaves on which these larva were found we thought it probable that the eggs had been deposited on the plum leaves by the parent fly. It was an occasion of regret afterwards that some had not been allowed to remain where nature had placed them, to see whether they would have reached maturity on food which we should regard as so uncongenial.

The figures here given represent the perfect fly on an enlarged scale, the hair lines at the sides showing the natural size; *a* is the male, *b* the female.



COAXING BUTTERFLIES TO DEPOSIT EGGS.

In the July number of the *Canadian Entomologist*, page 115, is a paragraph from Mr. W. H. Edwards, detailing an ingenious method of his, adopted with the view of obtaining eggs from butterflies by enclosing them in gauze-covered nail kegs, without bottom or top, along with a growing plant of such species as their natural instincts prompt them to deposit on. Carrying out the same idea in another form, and one better adapted to the purpose where large bushes or trees are concerned, we used good-sized muslin bags, so tied as to enclose a small branch or portion of the plant or tree with a few only of the leaves remaining on it, so as to lessen the labor of looking for the eggs and watching when they are deposited. A little ingenuity will enable one by the use of small bits of stick or wire to expand the bag so as to give plenty of room for the insects to flit about inside, and prevent its

collapsing with a shower of rain, and we think that by modifications of this method success in obtaining eggs from almost all our moths as well as butterflies might be secured.

We had often tried to obtain eggs from our commonest red butterfly, *Danaïs archippus*, by confining them in boxes within doors, but never succeeded in this way; but about the last of June, 1870, we captured four females and shut them up in a bag as described, tied on a plant of the common milkweed *Asclepias cornuti*, enclosing a few leaves only. As early as the next morning they had deposited a considerable number of eggs, which operation was continued for about another day when we counted them and found 150 in all, laid singly on all parts of both sides of the leaves, and also on the leaf stalks and on the muslin bag in which they were confined.

The eggs were 1-25th of an inch long, and a little less in width—exact measurement, 34-100ths of an inch. They were conical, quite flat at the base where attached to the leaf, with about 25 raised striæ or lines, and about the same number of cross lines between each stria, and in the meshes of the net work thus formed were slight cavities. Their color was white, with a faint yellowish tinge, and they were *very firmly* attached to the leaves.

Quite a number of the eggs hatched on the 5th of July, but having lost the date on which the butterflies were enclosed, the exact duration of the egg state cannot just now be given, but we believe it did not exceed six or seven days. The newly hatched larvæ were 1-10th of an inch long, with a large black head on which were a few dark brown hairs. The body was dull white with a slight bluish tint, spaces between the segments dull yellowish, there were a few black hairs on each segment, and the underside was similar in color to the upper but with fewer hairs, feet black; prolegs tipped with black. We had fully intended tracing the history of this larva out, noting the number of its moultings and the changes in appearance each time, but want of leisure prevented us.

THE PEAR TREE SLUG.

This disgusting little larva, the progeny of a little blackish sawfly, has been very abundant during the past season and has been the subject of some notes and experiments. In the first place we noted that there were two broods in the season. The parents of the first brood, which pass the winter in the chrysalis state, appear on the wing about the second or third week in May, depositing eggs from which the slugs are hatched, becoming full grown from the middle to the end of June, then entering the chrysalis state underground; the second brood of the flies make their appearance late in July. This year we noticed them at work depositing eggs on the 21st, the young slugs were abundant and about a quarter of an inch long on the 8th of August,

and by the 6th of September many of them were full grown. With us they were much more destructive to cherry trees than to pears, consuming the upper surface of the leaves, some giving the trees a scorched and sickly aspect, in many cases the foliage fell off, leaving the trees almost bare.

As soon as the slugs were observed at work in Spring, they were treated to a plentiful supply of dry sand thrown up into the higher branches with a shovel, and shaken over the lower ones through a sieve, which stuck thickly to their slimy skins, completely covering them up. Thinking we must have mastered them by so free a use of this long trusted remedy, we took no further heed of them for some days, when to our surprise they were found as numerous as ever. The next step taken was to test this sand remedy accurately to see what virtue was in it. Several small branches of pear trees were selected and marked, on which there were six slugs, and these were well powdered over—entirely covered with dry sand; on examining them the next morning it was found that they had shed the sand-covered skin and crawled out free and slimy again. The sand was applied a second and a third time on the same insects with similar results; and now being convinced that this remedy was of little value, they were treated to a dose of hellebore and water, which soon finished them. Ashes were now tried on another lot, the same way as the sand had been, with very similar results. It was also intended to try fresh air-slacked lime, which we believe would be effectual, but having none on hand just then, the experiment was postponed, and the opportunity of testing it lost for the season. We must not omit mention of an experiment with hellebore. On the 13th of August at 8 a.m. a branch of a cherry tree was plucked, on which there were sixty-four slugs; the branch had only nine leaves, so it may be readily imagined that they were thickly inhabited. A dose of hellebore and water was showered on them about the usual strength, an ounce to the pailful, when they soon manifested symptoms of uneasiness, twisting and jerking about in a curious manner; many died during the day, and only six poor sickly looking specimens remained alive the following morning, and these soon after died.

ACCENTUATED LIST OF CANADIAN LEPIDOPTERA.

BY E. B. REED, LONDON, ONTARIO.

(Continued from page 123.)

*** For Rules of Pronunciation see page 122.

COLIAS CHRYSOTHEME—*Chrysoth'eme*, probably meant for chrysothemis, a name given by Homer to Iphigenia, daughter of Agamemnon.

——— **PHILODICE**—*Philod'icē*. Gr. Philos, a friend; Dicē, one of the hours or seasons, this insect being common through spring, summer and autumn.

TERIAS—*Ter'ias*. Probably from Pteria, a city in Cappadocia, Asia Minor.

——— LISA—*Li'sa*. Probably from Lisæ, a city of Macedonia.

DANAIDÆ—*Dana'idæ*. The family of which the genus *Danaïs* is the type.

DANAIS—*Dan'ais*. From Danaï, a name often given to the ancient Greeks after Danaus, one of their kings.

——— ARCHIPPUS—*Archip'pus*. A king of ancient Italy.

NYPHALIDÆ—*Nymphā'idæ*. The family of which *Nymphalis* (a genus of exotic butterflies) is the type.

ARGYNNIS—*Argyn'nis*. A surname of Venus, from the Temple erected in her honour by Agamemnon on the death of his favorite Argynnis.

——— CYBELE—*Cyb'elæ*. An heathen goddess, wife of Saturn.

——— MYRINA—*Myri'na*. A city in Asia Minor.

——— BELLONA—*Bellō'na*. The Heathen Goddess of War.

——— APHRODITE—*Aphrodītē*. The Grecian name of Venus, the Heathen Goddess of Love, in allusion to the fable of her having sprung from the sea foam "Aphros."

——— COLUMBINA—*Columbī'na*. A feminine form of Columbus, the discoverer of America.

——— FREYA—*Frēya*. The Scandinavian Goddess of love.

MELITAEÆ—*Melitæ'a*. A town in Thessaly.

——— PHAETON—*Phæ'ton*. A mythological personage, famous for his unsuccessful attempt to drive the chariot of the sun.

——— HARRISII—*Harris'iū*. Named after Dr. T. W. Harris, the late talented State Entomologist of Massachusetts.

——— NYCTEIS—*Nyc'teis*. From Greek *nux*, night, in allusion to the dark colouring of the under side of the wings.

——— THAROS—*Tha'ros*. Probably meant for Pharos, a celebrated island in the Bay of Alexandria, famous for its lighthouse.

GRAPTA—*Grap'ta*, from the Greek "Grapho," to write or inscribe, in allusion to the letter-like markings of the under side of the wings of this genus.

——— INTERROGATIONIS—*Interrogatio'nis*. From the silver markings on the under sides of the wings like notes of interrogation (? ?).

——— COMMA—*Com'ma*. From the comma-like markings on the under side of the wings.

——— FAUNUS—*Fau'nus*. One of the heathen Roman Gods, the great Patron of the Art of Agriculture.

VANESSA—*Vanes'sa*. Probably from Swift's poem of Cadenus and Vanessæ, in which the Dean (*Decānus*) tells the story of his love for Esther (*Essa*) Vanhombrugh.

——— J-ALBUM—*J-Album*, the white J, from the J-like mark on the under side of the wings.

——— MILBERTI—*Milber'ti*. Milbert's butterfly.

——— PROGNE—*Prog'ne*. A daughter of Pandion, King of Athens.

——— ANTIOPA—*Antiōpa*. The mother of Amphion, the celebrated musician.

PYRAMEIS—*Pyramēis*. Greek *Pūramē*, a fire basket, in allusion to the bright flame like color of this genus.

- PYRAMEIS ATALANTA—*Atalan'ta*. A celebrated beauty, who made all her lovers run races with her on the penalty of death if they could not catch her.
 ——— CARDUI—*Car'dui*. Feeds on thistle (*Carduus nutans*).
 ——— HUNTERA—*Hunt'era*. Hunter's butterfly.

LIST OF COLEOPTERA,

TAKEN AT GRIMSBY, ONTARIO, BY J. PETTIT.

(Continued from page 133.)

CURCULIONIDÆ.

- Dryophthorus corticalis, *Say*.
 Rhyncolus ——— ?
 Cossonus corticola, *Say*.
 *Sitophilus nubilus, *Schr*.
 pertinax, *Oliv*.
 *cinerea, —.
 *Ceutorhynchus septentrionalis, *Sch*.
 *inæqualis, —.
 *Copturus quercus, *Say*.
 *oculatus, *Say*.
 *oblongus, —.
 Conotrachelus posticatus, *Sch*.
 nenuphar, *Hbst*.
 *anaglypticus, *Say*.
 *cratægi, —.
 *Rhyssomatus palmaris, *Say*.
 Mononychus vulpeculus, *Fab*.
 Grypidius ——— ?
 Cryptorhynchus luctuosus, *Sch*.
 obliquofasciatus, *Sch*.
 Baridius ——— ?
 *Madarus undulatus, *Say*.
 *Læmosaccus plagiatus, *Fab*.
 *Panscopus erinaceus, *Say*.
 Balaninus caryatipes, *Sch*.

- *Anthonomus suturalis, *Lec*.
 quadrigibbus, *Say*.
 *Otidocephalus scrobicollis, *Sch*.
 Erirhinus mucidus, *Say*.
 Magdalinus olyra, *Hbst*.
 Pissodes strobi, *Peck*.
 nemorensis, *Germ*.
 affinis, *Rand*.
 Lixus concavus, *Say*.
 *Phyxelus glomeratus, *Sch*.
 Aphrastus ——— ?
 Phytonomus ——— ?
 Hylobius pales, *Hbst*.
 *picivorus, *Sch*.
 Listroderes ——— ?
 Polydrosus elegans, *Couper*.
 Sitona lepidus, *Sch*.
 Arrhenodes septentrionis, *Hbst*.
 Apion ——— ?
 Ithycerus curculionoides, *Hbst*.
 Attelabus bipustulatus, *Fab*.
 Cratoparis lunatus, *Fab*.
 *Brachytarsus variegatus, *Say*.
 *Platythinus fasciatus.
 Piatorhinus ——— ?
 Bruchus pisi, *Linn*.

The above list of *Curculionidæ* is as full as I can make it at present, but I have a number of species not yet identified; it is a family of acknowledged difficulty, the American species of which have never yet been thoroughly worked up by any competent Entomologist.

* Species marked with an asterisk have not before been included in the list of Canadian Coleoptera.

ENTOMOLOGICAL SOCIETY OF CANADA.

A very poorly attended meeting of the Society was held at the Canadian Institute, Toronto, on the 5th of January. The following gentlemen were elected members :

ALEXANDER M. ROSS, Esq., M.D., Toronto;
J. GAMBLE GEDDES, Esq., Toronto; and
Prof. J. M. B. SILL, Detroit, Mich., a Corresponding Member.

The Secretary-Treasurer laid the following Financial Statement for the year 1870 upon the table :

RECEIPTS.

By Balance from 1869	\$0 85
" Members' subscriptions paid.....	20 00
" Sale of cork and pins.....	39 42
" " Lists of Lepidoptera and Coleoptera.....	2 95
" Grant from Agricultural Association	400 00
" " " Fruit-Growers' Association	50 00
" London Branch	20 00
" Donation from Mr. J. Pettit.....	15 00
" Grant from Agricultural Association for Woodcuts.....	106 77
	<hr/>
	\$654 99
	<hr/>

EXPENDITURE.

To Printing account, <i>Canadian Entomologist</i> , 1869.....	\$81 40
" Books for Library.....	30 95
" Expenses <i>re</i> Report.....	11 40
" Cabinet for Agricultural Association (expenses)	1 85
" " for London Branch	75 00
" Cork and charges	45 57
" Pins and charges	31 20
" Postage, \$10 20; sundries, \$2 75.....	12 95
" <i>Canadian Entomologist</i> , 1870.....	67 75
" Woodcuts for Report	156 77
" Preparation of Report	100 00
" Balance, December 31, 1870	40 15
	<hr/>
	\$654 99
	<hr/>

"CANADIAN ENTOMOLOGIST" ACCOUNT.

RECEIPTS.

By subscriptions	\$92 61
" Entomological Society	67 57
	<hr/>
	\$160 36
	<hr/>

EXPENDITURE.

To Printing	\$114 87
" Postage and Express.....	9 48
" Studley & Co., <i>American Entomologist</i>	36 01
	<hr/>
	\$160 36
	<hr/>

Members of the Society are respectfully notified that their subscriptions (\$2) are now due for the year 1871. From the above Statement it will be observed that many members are also in arrear for the year 1870.

All communications and remittances should be addressed to the Rev. C. J. S. BETHUNE, Trinity College School, Port Hope.

INCORPORATION OF THE ENTOMOLOGICAL SOCIETY.

Our readers will no doubt be pleased to learn that a bill is now before the Legislature of Ontario, for the incorporation of the Entomological Society, under the Agricultural and Arts Act. The effect will be to place it upon the same footing as the Fruit-Growers' Association of Ontario, with an annual grant of \$500 per annum.

A general meeting of the Society will be called as soon as the bill has passed the Legislature. We shall refer to the matter at greater length in our next issue.

SIXTH ANNUAL REPORT OF THE LONDON BRANCH OF THE ENTOMOLOGICAL SOCIETY OF CANADA, FOR THE YEAR ENDING DECEMBER 31st, 1870.

At the close of another year it becomes the pleasing duty of your Committee to present this the Sixth Annual Report.

The past season has been a favourable one for the Society. Our financial Report exhibits a good balance in hand after payment of all current expenses. Owing to the generous support the Society continues to receive, our roll of members still contains thirty-three names. Again we would thank our friends for their continued assistance to this the only Scientific Society at present existing in the "Forest City." With the liberal donation of the Parent Society we have been enabled to purchase a magnificent cabinet. To prepare it for the reception of insects will be a work of some little time, but we trust in due course to see its drawers gradually filled with choice specimens from all quarters. London has fairly earned a provincial reputation for its Entomological collections. At the Western Fair held in September, four prizes were obtained by our members, and the proceeds as usual transferred to our Treasury. Efforts have been recently made to induce the Society to

keep its material and hold its meetings in the "Mechanics' Institute" of this city now in course of reconstruction. Nothing definite has yet been done in the matter, but your committee would heartily recommend any co-operation with the Institute that can be effected without infringing on the distinctive features and objects of our Society. The publication of the "CANADIAN ENTOMOLOGIST" is still maintained and meets with fair encouragement we believe. We have every reason to hope that the Agricultural Association of Ontario will see fit to continue their grant of \$400 to the Parent Society during the coming year. We are glad to learn that under the auspices of the Parent Society a varied and useful report has been prepared on Insects affecting field and fruit crops, and the Association are having it printed and well illustrated with engravings, which they have most liberally provided. In this work, also, the Fruit Growers' Association of Ontario has given most material assistance by a donation of \$50 towards engravings. We hope to see these annual reports kept up, and believe that most excellent results may be obtained therefrom by their inducing both Agriculturists and fruit growers to become a little better acquainted with the habits and customs of their insect friends and foes. We would in conclusion again urge upon our members to assist by all means in their power, in procuring for the Society, any information that may be brought to their notice respecting any of the various species of the Insect world. We can assure them it will be most gladly received. We would also remind them, that any contributions to the cabinet will be most welcome.

EDMUND BAYNES REID,
Secretary-Treasurer.

WILLIAM SAUNDERS,
President, London Branch.

TREASURER'S STATEMENT, FOR THE YEAR ENDING DEC. 31, 1870.

RECEIPTS.—Balance from 1869, \$5 81; Members' Subscription, (28), \$56 00; Arrears for 1869, \$4 00; sale of Insect case, \$2 00; for the use of Apparatus, \$10 75; from Parent Society, grant for Cabinet, \$75 00; from Parent Society, grant to E. B. Reed, Travelling expenses, \$12 00. *Western Fair Prizes*.—J. M. Denton, \$8 00; Rev. G. M. Innes, \$6 00; Wm. Saunders, \$5 00; London Branch, \$3 00; E. B. Reed, Judge's fees, \$3 00;—Total, \$190 56.

DISBURSEMENTS.—Annual Subscription, Parent Society, \$20 00. *Repaid Loan on Apparatus*.—J. H. Griffiths, \$2 00; J. M. Denton, \$2 00. *Western Fair expenses*, \$5; 12,000 pins, \$12 00; printing Report for 1869, \$3 00; Cabinet, \$75. *Parent Society*.—E. B. Reed, Travelling expenses, \$12; Engravings, &c., as per account, \$30 51. Advertising, postage, &c., \$16 25; Cash in hand, \$12 80;—Total, \$190 56.

LIST OF MEMBERS FOR 1870.—W. Saunders, President; C. Chapman, Vice-President; E. B. Reed, Secretary-Treasurer; J. M. Denton, Curator; H. Becher, W. Barker, Dr. V. A. Brown, Hon. J. Carling, Wm. Carling, S. Chadwick, James Farley, J. H. Griffiths, Rev. G. Gordon, Very Rev. Dean Hellmuth, Rev. J. M. Innes, J. Jeffrey, J. Law, Dr.

Landor, W. M. Moore, Dr. Charles Moore, J. Macbeth, B. A. Mitchell, J. McMechan, S. Mummery, J. Nitschke, A. Puddicombe, Rev. A. Sweatman, A. G. Smyth, J. Symmonds, Dr. Sippi, E. A. Taylor, F. Westlake, I. Waterman.

OFFICERS FOR 1871.—C. Chapman, President; J. H. Griffiths, Vice-President; E. B. Reed, Secretary and Treasurer; J. M. Denton, Curator.

NEW BRANCH OF THE ENTOMOLOGICAL SOCIETY AT KINGSTON, ONT.

It is with much gratification that we announce to our readers that a new Branch of the Entomological Society of Canada has been organized at Kingston, Ont. We trust that it will go on and prosper, and emulate in hearty work and zeal the active Branch at London, which has been in successful operation for six years. The following letter has been addressed to us as Secretary to the General Society:

"DEAR SIR,—I have been instructed to inform you that on the 16th instant several gentlemen met and formed a Branch of the Entomological Society of Canada, subject, of course, to the acceptance or rejection of the Parent Society. We passed By-laws, a copy of which I enclose for your perusal and approval. We likewise elected the following Officers:—Prof. N. F. DUPUIS, President; E. H. COLLINS, Vice-President; and R. V. ROGERS, jun., Secretary-Treasurer.

I trust that you will lay our case before the next meeting of your Society, and let us know whether we are accepted or not as soon as possible.

The original members are, Prof. Dupuis, E. H. Collins, O. Meyes, Dr. Neish, T. C. Wilson, and myself.

Yours, &c. (Signed) R. VASHON ROGERS, JUN.

Kingston, Jan. 25, 1871."

DEATH OF MR. A. S. RITCHIE.

We were very much grieved to learn that Entomology has lost one of its most ardent students in this country, by the unexpected death of Mr. A. S. Ritchie, of Montreal, one of the Editing Committee of the *Canadian Naturalist and Geologist*, and author of many valuable and interesting papers on various subjects in Natural History. In our next issue we hope to be able to give further particulars respecting this sad event; at present we have only received information of the bare fact of his death.

At a recent meeting of the London Branch of the Entomological Society, the following resolutions were unanimously adopted:—

1. That the members of this Society have heard with deep regret of the sudden and unexpected death of Mr. A. S. Ritchie, of Montreal. We feel that Entomology has lost in him a warm advocate and an industrious student, and we a valued fellow-labourer. We tender our heartfelt sympathies to his bereaved family and friends in their great affliction.

2. That copies of the above resolution be forwarded to Mrs. A. S. Ritchie, the Secretary of the Natural History Society of Montreal, and the Editor of the *Canadian Entomologist*.

MISCELLANEOUS NOTES.

COLLECTING BEETLES IN AUTUMN AND WINTER.—I send you a few specimens of Coleoptera, some of which I think will prove acceptable. In the bottom of the quill you will find *Olisthopus micans*, Lec., and *Bembidium frontale*. In the middle *Sylvanus advena*, *S. Surinamensis*, and *Lathridius publicarius*. In the outer part *Loricera Neoscotica*, *Platynus Ruficollis*, *P. fuscescens*, Chaud.—the latter is not in Leconte's list. Except *Sylvanus* and *Lathridius*, these were taken late in November in a swamp by sifting the leaves from the dry spots (usually taken from the sunny side of an old log) over a cloth. I mention the mode of capture as it may be useful to you, and late in the season will be found the most successful. For a sieve I used a piece of net, such as is put over horses in fly-time, stretched over a hoop. Many common species were also taken. By the same process—using a fine sieve from a fanning mill—I obtained from a little hay, leaves, &c., that had accumulated about the sills of a barn, between 30 and 40 species of beetles, several new to my collection and two or three (*Trichopterygidæ*) that Dr. Horn supposes to be new to science. I think that early in spring the sifting process would be found useful about out-buildings, especially a barn or stable, as many insects are brought from the field in the hay, grain, &c.—JOHNSON PETTIT, Grimsby, Ont., Dec. 29th, 1870. [We are much obliged to our friend Mr. Pettit, for the interesting specimens that he has sent us, and shall be glad to receive further particulars from him respecting his captures and modes of collection.—ED. C. E.]

REARING BUTTERFLIES FROM THE EGG—I see by the July number of the *Entomologist*—you may not know that it has penetrated to this corner of the world—that Mr. Edwards has published an account of his method of obtaining butterflies eggs. Last June he wrote me of his success, and a day or two before I left America I put the experiment to proof on a small scale, using the cans used for preserved vegetables in lieu of a better substitute for Mr. Edwards "powder keg." In this way I obtained quantities of eggs of *Eud. Pylades* on clover and of *Neon. Eurytris* and *Hesp. Mystic* on grass. I had previously found eggs of *Pylades* in abundance in the fields, and had obtained some of those of *Mystic* from confined specimens, but in the latter case they were always laid loosely in the box, never attached, as those of other confined Hesperians. So far as I know, the eggs of *Eurytris* had never

been obtained previously. I have boxed large numbers both of this and of *Pylades* but invariably without result. I trust that others will be induced to try Mr. Edward's simple plan by which we may very greatly increase our knowledge of the earlier stages of butterflies.—SAMUEL H. SCUDDER, Cairo, Egypt, Nov. 15th, 1870.

NOVA SCOTIAN LEPIDOPTERA.—At a Meeting of the Institute of Natural Science, Halifax N.S., on Nov. 14th, the President, J. M. Jones, Esq., read a paper "On the Diurnal Lepidoptera of Nova Scotia, Rhopalocera, Part 1." The following species were common in the province, *Papilio turnus* Linn.; *Pieris oleracea* Harris, *P. rapæ* Boisd., *Colias philodice* Godt., *Argynnis aphrodite* Fabr., *Argynnis myrina* Cram., *Melitæa tharos* Cram., *Grapta C. argenteum* Kirby, *Vanessa antiopa* Linn., *Pyrameis cardui* Linn., *P. Huntera* Smith, *Nymphalis arthemis* Drury, *Erebia nephele* Kirby, *Satyrus alope* Fabr.; while *Danaïs archippus* Fabr., *Melitæa ismeria* Boisd., *Grapta interrogationis* Godt., *G. comma* Harris, *Vanessa J. album* Boisd., *V. milberti* Godt., *Pyrameis atalanta* Linn., *Nymphalis dissipus* Godt., *Debis Portlandia* Fabr., were rare. The author dwelt upon the introduction of *Pieris rapæ* into this part of the Canadian dominion within the last few years, and alluded to its abundance last summer in the neighbourhood of Halifax, where it did an immense amount of damage to the cauliflower crops. He mentioned the probable benefit that would arise from the introduction of the house sparrow of England (*Pyrgita domestica*) that great enemy of caterpillar life, which would amply repay the trouble and expense of importation. At the present time the caterpillars were almost free from molestation, and it was but proper, when possible, on the introduction of an insect pest, to introduce also its known enemy. The author had observed that even in so small a country as Nova Scotia many species of butterflies were quite local in distribution, and species quite common on one side of the province were altogether unknown on the other, although the distance between such positions was not more than thirty miles. Several Hesperians were yet unnamed, and these when identified with some Lycæniæns, would be included in Part 2.—*Nature*.

LARVA OF *SESIA DIFFINIS*, Boisd.—Length 1.5 to 1.7th inches; head slightly retractile, nearly round, apple-green, covered with minute white granulations; mandibles black; body whitish-green above, yellowish-green at the sides, deep black beneath; legs also black; dorsal and lateral regions thickly granulated in transverse lines; first segment with a yellow collar; caudal horn straight and long, black above and beneath, yellow at the sides; spiracles black, all except the first, somewhat encircled with whitish.

Variation of the above.—Head black, body pinkish above, and darker at the sides.

Food plant; the common Snow berry, (*Symphoricarpus racemosus*).

From five larvæ taken Sept. 21st, 1869, in Fayette Co., West Virginia, one imago emerged May 4th, 1870. The above described caterpillars seemed to differ considerably from the description in Morris' *Synopsis*.—THEODORE L. MEAD, New York.

INDIANAPOLIS ACADEMY OF SCIENCES.—We are pleased to learn that a new Scientific Society has been inaugurated at Indianapolis, Ind., under the above designation. As the Corresponding Secretary, Dr. W. W. Butterfield, and one of the Curators, Mr. G. M. Levette, are both entomologists, we may feel sure that our favorite branch of natural history will be by no means neglected.

LIST OF BRITISH INSECTS.—We are glad to see that the Entomological Society of London purpose to publish a general catalogue of the insects of the British isles. In pursuance of this purpose a catalogue of Neuroptera has just appeared. It is enough to state that it is edited by R. McLachlan, F.L.S., to insure confidence in its accuracy, that gentleman having a reputation in this branch of Entomology throughout Europe, and wherever English books are read. The synonymy is copious and we hope that other portions including other orders will soon follow. Meanwhile we commend this portion to our readers, in the hope that they will encourage the Entomological Society to proceed by spending a shilling for the good of British Entomology whether interested in this special branch or not.—*Science Gossip*.

THE WALSH COLLECTION.—We are gratified to state that our efficient State entomologist, Dr. Le Baron, acting under the advice of Gov. Palmer, has purchased for the use of the state the very extensive cabinet of insects which were collected by the late Benjamin D. Walsh. The price paid for the collection was \$2,500 which sum includes the un-paid salary of Mr. Walsh for six months. An order for the money was drawn by the Governor on the contingent fund. The cabinet is temporarily deposited in the fire proof building of the Chicago Academy of Sciences.—*American Entomologist*.

PLATEAU ON THE FLIGHT OF COLEOPTERA.—M. FELIX PLATEAU has supplemented the recent labours of Marey and others upon the flight of insects by examining the movements of the wings of certain Coleoptera. Specimens of the common May-beetle and *Oryctes nasicornis* were selected for experiment. The apparatus used consisted of two pulleys, fastened one above the other, at a distance of two centimetres, on a vetricial support; the upper

pulley made twelve turns for each one made by the lower, and could be caused to rotate twenty-four times in a second. The insects were killed by ether vapor immediately before each experiment; and the wings could be fastened, by a simple contrivance, to the front prolongation of the axis of the upper pulley.

A wing, in its folded state, was fixed on the instrument in such a manner that its plane made, with the plane of rotation, an angle of 45° , as in the living animal. On turning the pulleys, it struck the air obliquely by its upper surface and front margin; but the small diameter of the apparently continuous revolving disc (as indicated by a graduated scale) proved that the wing was still folded, and that centrifugal force had not affected it. When rotation was produced in an opposite direction, so that the wing struck the air both by its posterior membranous margin and interior surface, the increasing diameter of the disc gave proof of the expansion of the wing, which, indeed, continued to be much extended when motion was arrested. When the plane of a wing was perpendicular to the plane of rotation, and the revolution of the wheel was such that the wing struck the air by its dorsal or upper surface, no extension ensued; when it struck by its lower surface, only partial extension followed. Now the oblique, not the perpendicular plane, is that chosen by nature, and is as has been seen, much more favourable for flight.

On fixing an open wing on the axis so as to make an angle with the plane of rotation, and turning in one direction, the wing remained open; on reversing the direction (*i.e.* acting on the upper surface) it became partially closed.

EXCHANGES, &c.

LEPIDOPTERA.—Canadian Lepidoptera desired in exchange for British.—E. H. COLLINS, *Daily News* Office, Kingston, Ont.

PUPÆ AND OVA OF LEPIDOPTERA.—I am desirous to obtain, if possible, *live* Pupæ and Ova of certain Canadian and other North American Lepidoptera. Would purchase, or give in exchange English or other European species.—CHAS. GEO. ROTHERAM-WEBSDALE, 78 High-street, Barnstaple, England.

COLLECTING TOUR IN WESTERN TEXAS AND NEW MEXICO. — At the request of several gentlemen in this country and Europe, I intend to make an extensive eight or nine months Entomological collecting tour in Western Texas and Southern New Mexico, if sufficient means can be raised. I therefore invite every Entomologist, who wishes to enrich his collection with valuable and unknown species, to assist me in the undertaking. To give

everybody a fair chance to get a part of my collections at a limited price, I will divide them into shares at the following rates :

Whole share, \$25. Distribution to be from 250 to 500 specimens, in accordance with wishes (Diurnal Lepidoptera and specialties at agreement).

Half share, \$12 50. Half the above.

Young collectors or beginners at \$5 per 100 specimens.

All sums to be paid in advance.

I shall be obliged by receiving early information from all desiring to subscribe, stating at the same time their wishes. When and where the money is to be delivered, will be notified in due time. No insects will be sold separately after my return, except to subscribers. If anything should happen during the tour to prevent my fulfilling my engagements, or if any one dislikes his share, the money will be refunded. The Coleoptera and Diurnal Lepidoptera will be sent named. Address :—G. W. BELFRAGE, Waco, McLennan Co., Texas (Care of Forsgard & Co).

[We can cordially recommend Mr. Belfrage to our readers as an active and zealous collector : his mounting of specimens is the very perfection of neatness.—ED. C. E.]

ADVERTISEMENTS.

FOR SALE CHEAP.—A fine Oxy-Hydrogen Dissolving-View Apparatus, with Polariscope, Microscope, and Kaleidoscope complete; and a large collection of suitable slides. Apply to E. B. REED, London, Ont.

TEXAN INSECTS.—25,000 specimens of Insects from Texas, for sale or exchange (Reference to ED. CAN. ENT.)—G. W. BELFRAGE, Waco, McLennan Co., Texas. Care of Forsgard & Co.

CORK AND PINS.—We have received a fresh supply from England of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klaeger's pins, Nos. 1 to 6, price 50 cents (gold) per packet of 500. Orders will please state whether the package is to be sent by mail or express.

CLUB RATES.—In addition to the Club rates announced on the second page of the wrapper, we are enabled to offer the following :

The American Agriculturist (\$1.50), and *Canadian Entomologist* (\$1), for \$2.

Arthur's Home Magazine (\$2), and the *Canadian Entomologist* (\$1) for \$2.25.

The Children's Hour (\$1.25), and the *Canadian Entomologist* (\$1), for \$1.75.

AGENTS FOR THE CANADIAN ENTOMOLOGIST.

CANADA—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P. Q.; G.

J. Bowles, Quebec, P. Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y.

Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, N. Y.

ENGLAND.—Wm. Wesley, 81 Fleet Street, London, E. C. Subscription 5s. per Vol.

The Canadian Entomologist.

VOL. II.

TORONTO, DECEMBER, 1870.

No. 12.

OUR THIRD VOLUME.

At the commencement of the year 1870, when relating the improved prospects of the Entomological Society of Canada, we remarked that we had then safely accomplished our first moult, but still continued in a larval state. Most of our readers will no doubt agree with us in the opinion that we were quiescent long enough between the issues of the ninth and tenth numbers of this volume to satisfy the requirements of a pupal state, and that now we may not be thought guilty of presumption when we say that with the first number of our *Third Volume* we expect to come forth in full imago form. We do not intend to burst upon the astonished vision of the Entomological world bedecked with gaudy hues and full of airy lightness, as a gay butterfly in May; but we may perhaps compare ourselves with more propriety to one of those Orthopterous creatures who gradually develop their full powers, without sudden or striking change, and who keep up their larval appetite and tastes to the end. Did we liken ourselves to Lepidoptera, it might be thought that our only office was to sip the sweets of fragrant flowers, and bask for a brief day in the sunshine of prosperity, free from care or thought for the morrow. As Orthopterous, however, we trust that we are of more substantial build, and that, while we gradually increase in size and strength, we may pursue with straight wing the even tenor of our way—borne along on the winds of science, and gathering as we go a full store of contributions, subscriptions, and aid of all kinds.

So much by way of introduction. Let us now briefly state that the **THIRD VOLUME** of the **CANADIAN ENTOMOLOGIST** will be printed on toned paper, illustrated with frequent wood-cuts, and enlarged to twenty pages a number. The subscription will continue to be as at present, *one dollar* (\$1 25 in U. S. currency) per annum in advance, while subscribers will have the additional privilege of becoming members of "The Incorporated Entomological Society of Ontario," if resident within the Dominion of Canada, or associate members if outside the boundaries of this country. We shall endeavour to issue a number regularly each month, and our aim will be to make our periodical

what a correspondent has been kind enough to designate it already, "concise, scientific and accurate." We are happy to announce that our labours will be lightened and our pages improved by the addition of an Editorial Committee, consisting of Messrs. Saunders, Reed and Denton, of London. The magazine—in consequence of various changes that have been made in the Society in connection with its recent incorporation—will in future be printed and published at London, Ont. All remittances and other business communications should be addressed to the Secretary-Treasurer of the Society, E. BAYNES REED, Esq., London, Ont.; all articles, &c., for insertion, to the general Editor, Rev. C. J. S. BETHUNE, Trinity College School, Port Hope, Ont., or to any member of the Editing Committee.

With this number we close our second volume. On looking back over its pages, we cannot refrain from congratulating ourselves upon the measure of success that our little periodical has achieved, though at the same time we are fully conscious of the many failures, shortcomings and imperfections that have occurred during its career. Its chief value has consisted, all will no doubt admit, in its being the means of bringing before the Entomological world the investigations and discoveries of many workers in widely scattered fields; notably among whom we may be permitted to give honourable mention to the name of our warmly esteemed friend, Mr. Wm. Saunders, of London. Our friendly circle of correspondents and contributors—one and all of whom we heartily thank for past favours—will not, we trust, diminish during the progress of the new volume, but will widen out and include the names of many more, till we receive tidings of the Insect world from every Province and State of America, from every county and township of Ontario.

MARCH 29, 1871.

REARING BUTTERFLIES FROM THE EGG.

BY W. H. EDWARDS, COALBURGH, WEST VA.

The results of my experiments with *P. Ajax*, as noticed in Nos. 8 and 9 of the *Canadian Entomologist* (Vol. ii. pp. 115 and 133), are as follows:

From six larvæ obtained from eggs of *Ajax*, deposited in captivity, 16th May, 1870, I obtained two males, four females, *Marcellus*, between 20th and 24th June.

From twenty-four larvæ from eggs of *Ajax* deposited 2nd June, I obtained twelve males, ten females, all *Marcellus*, between 3rd and 9th July, and one chrysalis went over the winter.

From five larvæ from eggs of *Marcellus*, deposited 7th June, I obtained four female *Marcellus* between 4th and 9th July, and one chrysalis went over the winter.

From eighteen larvæ from eggs of *Marcellus*, deposited 2nd July, I obtained fourteen chrysalids, and from these four males, three females, *Marcellus*, between 31st July and 3rd August. One of these chrysalids gave female *Marcellus* on 28th August, several weeks beyond its season, and six went over the winter.

From two larvæ from eggs of *Marcellus* deposited late in August, one yielded in September female *Marcellus*, the other in chrysalis went over the winter.

All these that wintered are alive at the date of this writing.

Mr. T. L. Mead, who spent the summer at Coalburgh, raised a large number of larvæ from several black female *Turnus* (*P. Glaucus*) enclosed in gauze bags on the branches of Tulip Trees, and from these in October we had between 45 and 50 chrysalids. I also obtained several larvæ from *Glaucus* by enclosing the females in a barrel placed over a young tree. We were desirous of seeing the results of breeding from *Glaucus*, and these, when the imagos appear, shall be communicated.

On 2nd June I confined females *Hesp. Pylades*, Scud., in a keg over a plant of *Desmodium Dillenii*, and obtained many eggs. On 4th June, from females *Lycidas* on same plant I obtained eggs. I raised several broods of *Philodice* in same way.

Mr. Mead (July 5) brought in several larvæ of *Melitæa Harrisii*, feeding on *Actinomeris helianthoides*, Nutt. These were of two broods, and some were $\frac{1}{4}$ inch long others about $\frac{1}{2}$, all alike, black, covered with spines and with a faint yellow lateral stripe. They seem to require dampness, and I succeeded in bringing one of these to maturity by keeping it confined in a close tin box. The previous year I had lost all my larvæ of this species, which I had attempted to feed in open boxes. The chrysalis resembles in form and markings that of *Phaeton*, though the larvæ differed generically from the the larvæ of *Phaeton*. The figure of the larva of *Harrisii* in Packard's Guide is incorrect. Indeed that represents no larva of a butterfly, but of some moth probably.

Sept. 20, Mr. Mead brought in a larva that was quite new to us, generically so, and we thought it might be the coveted *Diana* at last. It was yellow-brown, glossy, with six rows of fleshy spines, all steel-blue in color. Between these spines, in the dorsal rows, white tuberculated spots; the head furnished with two long black spurs like antennae, jointed, and at the end clubbed. This he found on a black alder resting on a leaf. In three days it refused all food (alder), and remained most of the time when observed motionless, but occasionally was very restless, evidently

hungry. Mr. Mead tried it with several sorts of leaves, among them violet, giving it also a drop of water which it greedily drank. It soon after began to eat the violet, and being fed on that grew rapidly, and by 25th September had attained a length of $1\frac{1}{2}$ inches. On 1st October it changed to chrysalis, and resembled much in shape that of *Phaeton*, the surface clear pearly color, partly iridescent, and covered with metallic bronze tubercles. During my absence from home the last two weeks of October, this chrysalis yielded imago, *Euptoieta claudia*. Boisduval & Leconte pretend to represent this larva, but we did not suspect the species from their figure.

The presence of this larva on alder several feet from the ground indicates that it rests during the day and returns at night to its food plant (violet). It travelled with wonderful rapidity, and a daily journey of ten feet would be a small affair for it. Very likely the larvæ of other Argynnidae have the same habit, and might be found by beating the bushes near their food-plant rather than by searching the plant itself.

I was not successful this year in obtaining eggs of either of the large Argynnis. In 1869 I succeeded in hatching larvæ of *Diana*, *Cybele*, and *Aphrolite*, but one after another fell off the food plant (violet and veronica) apparently dried up. Dr. Hayhurst, of Sedalia, Mo., to whom I sent eggs of *Diana*, brought one larva to second moult when it also died. I believe this was owing to the dryness of the feeding boxes. The larvæ, in a state of nature, feed on low growing plants in shady, moist situations. Probably feeding in tin boxes kept moist would answer the purpose. The larva of *Euptoieta* seems eager for water, a thing quite new in my experience with any larvæ, and both those of *Argynnis* and of *Melitæa* may have the same need.

Coalburgh, W. Va., 27th February, 1871.

[NOTE BY ED. C. E.—The above interesting and valuable communication from Mr. Edwards is, we are happy to say, the precursor of many more. In a recent letter he states, "I shall take pleasure in writing pretty regularly to your Journal respecting my own insect breeding, and if other observers will do the same, we can soon get in convenient shape for reference a great deal of information of value to those interested." We trust that this suggestion will be carried out, and that Entomologists throughout North America will freely avail themselves of our pages for the recording of their observations in this and other branches of the science.]

ON THECLA INORATA, G. & R., AND THECLA FALACER, Godt.

BY AUGUSTUS R. GROTE, DEMOPOLIS, ALA.

In the proceedings of the Boston Society of Natural History, Mr. S. H. Scudder publishes a paper, "On the Synonymy of *Thecla Calanus*," under date of March, 1870.

Mr. Scudder says: "In Eastern North America there are two species of *Thecla*, closely allied, occupying, so far as we know, the same geographical area (from Canada to Virginia or Georgia, and from Massachusetts to Iowa), and, until recently, almost invariably confounded by American entomologists. Messrs. Grote & Robinson first called public attention to the fact of their specific distinctness, although Mr. W. Saunders, both in his correspondence and MSS., had previously urged the same point. As my material was insufficient, and because certain specimens to which I had constant access seemed to combine many of the features which generally separated the specimens into two groups, I have hitherto been unwilling to accept the determinations of these Entomologists. But recently, through the kindness of many friends, I have had the opportunity of examining more than one hundred specimens of each species, and have become entirely convinced of their specific value."

Mr. Scudder then goes on to say: "The most prominent points of distinction between the two species are to be found in the general tint of the upper and under surfaces of the wings, in the presence or absence of orange spots near the anal angle of the secondaries, and in the nature of the extra mesial band upon the under surface."

These points of distinction between the two species, *Thecla inorata*, G. & R., and *Thecla calanus*, Hubner, *spec nobis*, we had previously urged in separating the two species, with the exception that we availed ourselves of no character drawn from the extra mesial band of the under surface in so doing. Mr. Scudder is more fortunate in this respect, and finds "most striking differences between the species" in the character offered by the extra mesial band of the under surface. From a perusal of Mr. Scudder's paper, it might be inferred we had, in separating the species, entirely overlooked the point. Yet this is not the case. In our first paper on the subject we discuss the aspect of this extra mesial band in the closely allied species of *Thecla* belonging to this group. In the Transactions of the American Entomological Society, page 173, August, 1867, we say:—*T. fulacer*, Harris, Ins. Inj. Veg. p. 276, may be assumed as a synonym of *T. calanus*, since, while the "orange colored spot" of the secondaries above is mentioned, "there are two rows of spots bordered on one side only with white," crossing the wing beneath. This latter character would hardly apply to *acadica*, the only other

species to be here considered, since the inner discal band is here completely macular; and though in *T. calanus* this band or row of dark brown spots is also, but more faintly, edged inwardly by a white line, we may assume that this inner edging, always fainter and sometimes wanting on the primaries (*T. calanus* and *T. falacer*), always wanting on the primaries, and in one specimen on the secondaries (*T. inorata*) is not sufficiently constant to afford a specific character. While Harris' *T. falacer* cannot be referred to *Thecla falacer*, Godt, sp., as illustrated by Boisd. Lec., it is probable that his specimens are to be referred to *T. calanus* rather than to *T. acadica*.

It may be here remarked that our conclusion as to Harris' specimens turns out to be correct, for Mr. Scudder refers them in this same paper to *T. Edwardsii*, which is the same as *T. calanus nobis*.

Mr. Scudder further finds that the distinctive character found in the orange spots of the upper surface of the secondaries only to be of relative value, since specimens of *T. inorata* have occurred with these spots, and of *T. calanus* without them, the reverse having been assumed by ourselves in our former papers as the fact. It is, however, quite clear that these spots are the rule with *T. calanus*, the exception with *T. inorata*.

With respect to the synonymy of the two species to be separated, Mr. Scudder differs remarkably from ourselves.

He considers Hubner's figure of *calanus*, which agrees in both sexes with our *T. calanus* in its slightly greater expanse as compared with *T. inorata*, its more brownish color, and in the very distinctly orange spotted secondaries above, as representing *Thecla inorata*, and this mainly from the character of the extra mesial band.

Mr. Scudder says: "The color of the under surface in no way resembles that of *Edwardsii* (*T. calanus nobis*), and is precisely the same as *calanus* (*T. inorata nobis*): a small orange spot painted near the anal angle of the upper surface of the secondaries in both sexes, occurs more frequently in *Edwardsii*, but is by no means absent from *calanus*."

And further: "The orange lunule of the under surface is given rather as it usually occurs in *Edwardsii*, than as in the *calanus*, but is not very common in the latter; and finally, the sexual patch on the upper surface of the primaries of the male is as in *calanus*. That the extent of the coloring is faulty is shown by several features in which it exaggerates either species, and only when doing so does it approach *Edwardsii* rather than *calanus*; in all features of pure delineation it resembles only *calanus*, so that there can be no possible doubt that Grote and Robinson's *inorata* is the same as Hubner's *calanus*.

If Mr. Scudder is right, then the species he calls *Thecla Edwardsii* must be called *Thecla falacer*, Godart. The question of the synonymy of these

species was fully in our mind when we visited Dr. Boisduval in Paris. In the collection of this savant is the typical specimen of Godart, and it is a specimen of *Thecla calanus*, nobis, for which we have used the name of *Thecla Edwardsii* as a synonym. But we are by no means satisfied that Mr. Scudder is right. Opinions may well differ as to a figure without description, which even Mr. Scudder finds faulty. It may be said with equal justice that Hubner's figure represents *T. calanus*, nob. (*T. Edwardsii*), and only where it is defective does it approach *T. inorata* (*T. calanus*, Scudder).

The chances are also against Hubner's having figured both sexes of the usually unspotted *T. inorata* with the spotted secondaries of *T. calanus*, nob. Leconte has certainly figured *T. inorata*, and as we stated before, Boisduval has used the specimen of Godart's *T. falacer* (*T. Edwardsii*, Saund.), while furnishing the text. Boisduval considered Leconte's plate as representing a form of *T. falacer*, Godart, and erroneously so, as Leconte figured for the first and only time *Thecla inorata*; Mr. Scudder's version of Hubner's plate to the contrary notwithstanding. We are at a loss to understand Mr. Scudder's remark, that we have come to an "erroneous conclusion respecting Boisduval and Leconte's plate, which, bad as it is, can certainly only represent *calanus*," (i. e. *T. inorata*). With the exception of the stricture, this accurately represents our published opinion with regard to that plate.

Dr. Boisduval cited Hubner's *calanus* in the text to *T. falacer*, because he considered, and in our opinion correctly, that Hubner's figure represented Godart's species, which latter he had before him. But that he mistrusted both Hubner's and Leconte's figures is very evident. He preferred Godart's later name and used his type.

With respect to the citations of Mr. Scudder, under the synonymy of the two species, there is much that is unnecessary as well as erroneous. Any reference to such an inaccurate compilation as that of Mr. Weidemeyer is a work of supererogation in a matter like the present. Leaving Hubner's figure on one side, we have Godart and Harris's description of *Thecla falacer*, and our own of *T. inorata* to fall back upon, so that the certain determination of the two species with all necessary citations is as follows:

THECLA INORATA:

Thecla inorata, G. and R. Descrip. Am. Lep. No. 3, p. 1, January, 1868.

Thecla falacer, Boisd. Lec. plate xxix., figs 1-5.

Thecla inorata, Saund. Can. Ent., Vol. II., 61-64; G. and R. Trans. Am. Ent. Soc. I. 172-3.

THECLA FALACER:

Thecla falacer, Godart Encyc. ix. 600, 633; Boisd. Lec. (text in part); Harris, Treat. Ins. Veg. Ed. 1862, 276.

Thecla Edwardsii, Saunders i. Litt. G. and R. Trans. Am. Ent. Soc. I. 172.

(?) *Rusticus armatus calanus*, Hubner, Exot. Schm. i., figs. 1-4.

Thecla calanus, Westw. Gen. Diurn. Lep. ii., 486; G. and R. Trans. Am. Ent. Soc. I. 172-3.

We omit purposely all references to Mr. Scudder's notices of these species. Two brief notices of the occurrence of *T. falacer* in New England preceded the paper in the Boston proceedings noticed, and to which the present is a reply.

With respect to the geographical distribution of the two species, while occurring side by side in the Atlantic District, it is probable that *Thecla inorata*, already found from Canada to Georgia, may be found over a wider expanse of territory than *Thecla falacer*.

Demopolis, Ala., December, 1870.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 145.)

67. TRECHUS [BRADYCELLUS] TIBIALIS, *Kirby*.—Length of body $2\frac{3}{4}$ lines. Only a single specimen taken.

[47] Body black, somewhat glossy. The tip of the palpi and scape of the antennæ are rufous; the prothorax is rather wider than long, but nearly square; the short basilar furrows observable in *Argutor* distinguish this species from the succeeding ones: elytra lightly furrowed, furrows impunctured; in the usual situation adjacent to the second furrow a little beyond the middle of the elytrum a very minute punctiform impression is just discernible; the lateral margin and suture at the apex of the elytra are reddish: the tibiæ are rufous but the cubit is black at the tip; the tarsi are darker, the hand has four dilated joints as in the other species of the genus.

[Belongs to *Bradycellus*; for a synopsis of the N. American species by Dr. LeConte, *vide* Pro. Acad. N. S. Phil., Dec. 1868, p. 379.]

68. TRECHUS [BRADYCELLUS] RUFICRUS, *Kirby*.—Length of body $2\frac{1}{2}$ lines. Only one specimen taken.

Body black, glossy. Palpi piceous; scape of the antennæ and mouth rufous: prothorax subobcordate; channelled, channel not abbreviated, margin rufous especially the basilar; angles rounded; basilar impressions single, round and punctured: elytra lurid or dirty yellow, with a large blackish cloud or blotch beyond the middle: legs dull rufous, thighs darker. [Included by LeConte, *loc. cit.*, under *B. badiipennis*, Hald., a species taken at Grimsby, Ont., by Mr. Pettit.]

69. TRECHUS [BRADYCELLUS] FLAVIPES, *Kirby*.—Length of body $2\frac{1}{2}$ lines. Many taken in Lat. 54° .

[48] Body piceous, glossy. Head underneath, nose, mouth, and oral organs—except the palpi which are pale yellow—and antennæ rufous; three

first joints of the latter paler than the others: prothorax rufous, rather longer than wide, between square and obcordate; basilar impressions single, very slight, punctured, and black: elytra rufous, with a broad black stripe adjoining the suture and parallel with it; furrows rather deep, impunctured: legs pale yellow.

N.B.—In the majority of specimens the black stripe of the elytra is very faint, and in some evanescent, and the impressions as well as the rest of the prothorax rufous. [Previously described as *B. rupestris*, Say.—Ent. Works ii. 505. Very common in Canada.]

70. *TRECHUS IMMUNIS*, Kirby.—Length of body $1\frac{3}{4}$ lines. Two specimens taken with the preceding species.

Similar to *T. flavipes* but smaller, the nose is piceous, the thorax is more dusky; dorsal channel indistinct; basilar impressions deeper and impunctured: elytra dark piceous with merely the bead of the lateral margin rufous; the furrows also are more lightly drawn: legs darker. [Le Conte, *loc. cit.*, states that he has not identified this species, but that it is perhaps *Stenolophus carus*, Lec., though the description is scarcely sufficient to warrant the placing of the latter in synonymy.]

71. *TRECHUS* [*BRADYCELLUS*] *SIMILIS*, Kirby.—Length of body $3\frac{1}{2}$ lines. Two specimens taken in Lat. 54° .

Body black, glossy. Mouth reddish yellow; palpi yellow; upper-lip and mandibles rufous, the latter black at the tip; antennæ dusky-rufous, three first joints more yellow: prothorax between obcordate and square, with the whole of the base distinctly and grossly punctured; basilar impressions shallow; limb of the prothorax is reddish-yellow, the disk is occupied by a large square black spot: the suture, lateral margin, and apex widely, and the inner base of the elytra, are reddish-yellow; [49] adjoining the suture is a broad black stripe not reaching the apex; the furrows are rather deep and impunctured; and in the usual situation, a little beyond the middle, a punctiform impression is adjacent to the second furrow: the sides of the fore-breast, the anus and the legs, are reddish-yellow.

Var. B. Thorax without a black spot in the disk, body underneath piceous. [Previously described as *Feronia atrimediis* by Say.—Ent. Works ii. 466.]

[50] 72. *ISOPLEURUS NITIDUS*, Kirby.—Plate i. fig. 6. Length of body $3\frac{1}{2}$ lines. A single specimen taken in the Rocky Mountains.

Body very glossy, underneath rufo-piceous, above bronzed with a light tint of piceous. Upper-lip rufous; palpi, antennæ which are slender, side-cover of the elytra and legs reddish-yellow: prothorax rather wider than long, punctured posteriorly, basilar impressions doubled: furrows of the elytra

slightly punctured, at the apex impunctured. [Placed in Le Conte's List, p. 10, with a mark of interrogation, under *Amara septentrionalis*, Lec., and with the note that the name has been previously employed for another species.]

[51] 73. *PATROBUS AMERICANUS*, *De Jean*.—Three specimens taken in Lat. 54°. Length of body $5\frac{3}{4}$ lines.

[Previously described as *Feronia (Patrobis) longicollis*, Say.; not uncommon in Ontario. For description *vide* Say's Ent. Works, ii. 466.]

[52] 74. *PERYPHUS [BEMBIDIUM] BIMACULATUS*, *Kirby*.—Length of body $3\frac{1}{4}$ lines. Taken in lat. 65°.

Body glossy, underneath black, above black-bronzed with a slight greenish tint. Head triangular, with a thick convex neck; frontal impressions long and deep; antennæ longer than the prothorax, third joint of the length of the succeeding ones; scape and palpi rufous; prothorax obcordate convex, at the base depressed, constricted and grossly punctured; dorsal channel as in *Patrobis*; basilar impressions single, round and deepish; elytra slightly furrowed, with the furrows punctured; the seventh from the suture nearly obliterated; apex nearly smooth, near which is an oblique pale spot; legs rufous with darker thighs, especially in the middle.

N. B.—When the elytra are raised from the body, they are dusky-bronzed. [The old genus *Peryphus* is included by Le Conte as a group under *Bembidium*, Pro. Acad. N. S. Phil. 1857, p. 3.]

75. *PERYPHUS [BEMBIDIUM] SORDIDUS*, *Kirby*.—Length of body 3 lines. A single specimen taken in lat. 54°.

This so nearly resembles *P. bimaculatus*, that I first put it aside as an immature specimen, but further consideration induces me to consider it as distinct. It is wholly pale rufous, except the head, the prothorax and the anus: the three first joints of the antennæ and the base of the fourth are also rufous: the prothorax appears rather narrower in proportion, and less distinctly punctured at the base; the spot at the apex of the elytra is larger, and the thighs are rather slenderer.

[53] 76. *PERYPHUS [BEMBIDIUM] SCOPULINUS*, *Kirby*.—Two specimens, taken in lat. 54°. [Previously described as *B. postremum*, Say, Ent. Works, ii. 561].

77. *PERYPHUS [BEMBIDIUM] RUPICOLA*, *Kirby*.—Taken abundantly in lat. 54° and 65°. Length of body $2\frac{1}{2}$ lines.

This little species appears to be the American representative of *P. littoralis*, which in many respects it closely resembles. It is, however, a smaller insect. The body is invariably piceous or rufo-piceous, and the head and prothorax are of the same colour, bronzed; the antennæ are ferruginous, with the scape

paler; the prothorax is rather shorter. [Included in Le Conte's List as a variety of *B. rupestre*, Dej., *tetracolum*, Say, Ent. Works, ii. 503].

[54] 78. *PERYPHUS* [*BEMBIDIUM*] *PICIPES*, *Kirby*.—Length of body $2\frac{1}{4}$ lines. Two specimens taken in lat. 65° .

Body black, glossy, above scarcely at all bronzed. First joint of the antennæ rufo-piceous; sculpture of the head, prothorax and elytra precisely that of the preceding species of the genus; elytra unspotted, with two punctiform impressions situated as in *P. scopulinus*, &c.; legs rufo-piceous. This comes very close to *P. nitidulus*, but that species has no punctiform impressions, and the legs are of a different colour.

79. *PERYPHUS* [*BEMBIDIUM*] *CONCOLOR*, *Kirby*.—Length of body $2\frac{1}{2}$ lines.

Body and members black, glossy, above bronzed. Scape of the antennæ piceous; prothorax less constricted behind than in *P. picipes*; space between the basilar impressions impunctured; elytra more deeply furrowed with larger punctures in the furrows; the lateral furrows are not obliterated, but the apex of the elytrum is impunctured. [A species unknown to Le Conte.]

80. *PERYPHUS* [*BEMBIDIUM*] *QUADRIMACULATUS*, *Linn.*.—Two specimens in lat. 54° . [Subsequently described as *B. oppositum*, Say.—Ent. Works, ii. 501; taken in Canada.]

[55] 81. *PERYPHUS* [*BEMBIDIUM*] *NITIDUS*, *Kirby*.—Plate i. fig. 7. Length of body $3\frac{1}{2}$ lines. Two specimens, taken lat. 54° .

Body linear-oblong, subdepressed, very glossy, underneath black, above black-bronzed. Head triangular; frontal impressions long and rather curvilinear; scape of the antennæ rufous underneath; prothorax nearly square, and level with curving sides; dorsal channel nearly obsolete; basilar impressions double, the inner one round and rather deep, the other very slight, with a little ridge between it and the margin; anterior and posterior margin nearly straight; elytra with sides nearly parallel as well as the apex impunctured; a quintuple series of punctures adjoins the suture, which extends very little beyond the half of the elytrum, with traces of slight furrows beyond it. [Taken in Canada; a specimen in our collection from Mr. B. Billings, Ottawa, Ontario; at Fort Simpson, Mackenzie River, by Mr. Kennicott; and in the Platte River Valley, by Dr. Le Conte].

[56] 82. *TACHYTA* *PICIPES*, *Kirby*.—Plate viii. fig. 6. Length of body $1\frac{1}{2}$ lines. Four specimens, taken in lat. 54° .

Body black, glossy. Frontal impressions rather oblique; eyes less prominent than usual in the tribe; prothorax broader than long, subobcordate; basilar impressions, which are single, and dorsal channel, rather deep; elytra with three obsolete impunctured furrows next the suture, which do not reach the apex. Apex rounded; legs piceous. [Previously described as *Tachys*

nanus, Schaum, and *Bemb. inornatum*, Say.—Ent. Works, ii. 502; taken in Canada.]

[57] 83. NOTAPHUS [BEMBIDIUM] NIGRIPES, *Kirby*.—Length of body 2 lines. Three specimens, taken in lat. 54°.

Body black, glossy; above bronzed with a greenish tint; the whole upper surface, under a powerful magnifier, appears covered with innumerable granules, which are much more distinctly seen in this family than in the *Peryphideæ*. Scape of the antennæ, which are longer than the prothorax, rufo-piceous; frontal impressions parallel; the punctiform impression adjoining the eyes on their inner side has a central elevation: prothorax short, with a deep dorsal channel; basilar impressions double, with a little ridge between the external one and the margin: elytra furrowed; furrows punctured for about two-thirds of their length; the first and second reach the apex, where they are confluent; the third and fourth stop a little short of the apex, and are also confluent, as are the fifth and sixth, which are still shorter, and terminate in a little furrow common to both; the seventh and eighth reach the apex, where they likewise unite; two punctiform impressions, in the usual situation, adjoin the third furrow; at the base of the elytrum, in the interstice between the fifth and sixth furrows, is a longitudinal lurid streak, then follows an abbreviated and articulate band of the same colour, consisting of four streaks, those near the lateral margin being much the longest; in the interstices between the second and third furrows are two such little streaks; near the apex is likewise another band, both articulated and undulated, consisting of seven spots, the marginal one being rather the longest; the tips of the elytra are likewise lurid.

N. nigripes is related to *N. ustulatus*, and appears to be its American representative; it differs from it in having black legs, and the lurid markings of the elytra are different: it comes nearest to Gyllenhal's Variety C. [*Vide* Pro. Acad. N. S. Phil., July 1860, p. 316.]

[58] 84. NOTAPHUS [BEMBIDIUM] INTERMEDIUS, *Kirby*.—Length of body 1½ lines. A single specimen, taken in lat. 54°.

Very nearly related to *N. nigripes*, but the head and prothorax are greener; antennæ as long as the prothorax; the palpi are rufous, with the penultimate joint rather dusky; elytra bronzed-lurid, with a round black spot near the base, a larger near the apex, and an angular band of the same colour between them; the legs are dull rufous. The sculpture of the elytra is nearly the same as in that species, but the fifth furrow, by a turn outward, almost intercepts the sixth and seventh, and then runs to the apex of the elytrum; the furrows themselves are black.

85. NOTAPHUS [BEMBIDIUM] VARIEGATUS, Kirby.—Length of body $1\frac{3}{4}$ lines.

This also is related to *N. nigripes*, but is quite distinct. The head and prothorax are without any green tint; the antennæ are not longer than the prothorax; the prothorax is proportionally not so wide before and narrower behind; elytra scarcely at all bronzed; lurid with a large blackish cloud or spot near the base, another near the apex, and an intermediate black angular band; the furrows of the elytra, especially the external ones, do not reach the apex, or at least are obliterated; they are punctured the whole of their apparent length; instead of two, there are three punctiform impressions; the legs are rufo-piceous. [This name is preoccupied by Say's species; Le Conte considers Kirby's species synonymous with *B. versicolor* Lec.]

[59] 86. BEMBIDIUM IMPRESSUM, Gyll. — Length of body $2\frac{1}{2}$ lines. Taken frequently in lat. 54° and 65° , and in the journey from New York to Cumberland House. On the sandy shores of Lake Winnipeg, in the spring of 1825 (Mr. Drummond). In Canada (Dr. Bigsby).

[60] Body underneath green, bronzed, very glossy; above bronzed, gloss much obscured, occasioned by an infinity of most minute reticulations, visible only under a good magnifier, which give it a granulated appearance; frontal impressions and ocellated punctures as in *Notaphus*; eyes very large and prominent; palpi bronzed, with the second joint obscurely rufous; antennæ longer than the prothorax, with the scape and the base of the second and third joints rufous; prothorax short, depressed both at the base and apex, the depressed part being wrinkled longitudinally; dorsal channel and basilar impressions rather deep; in the latter are two little furrows; in the elytra, a little beyond the middle, in the interstice between the second and third furrows, are two quadrangular, oblong, slightly depressed spaces, of a somewhat golden lustre, and marked at the anterior end with a punctiform impression; immediately before, between, and after the depressed spaces, is a levigated and rather elevated one of the same shape; the furrows of the elytra are arranged nearly in the same way as those of *Notaphus intermedius*, above described: the legs are rufous, with the thighs bronzed at the apex. [Taken in Canada.]

Genus OPISTHIUS, Kirby.

Oral organs scarcely different from those of *Elaphrus*.

Body depressed and flat. Head triangular, antennæ much more slender and longer than those of *Elaphrus*, 3rd joint rather longer than 4th. Prothorax very short, transverse, scarcely wider than the head; anteriorly obsoletely obtus-angular, posteriorly subrepand, depressed a little at base and apex; channelled, but without basilar impressions; sides gibbous; angles all

obtuse. *Scutellum* rather obtus-angular. *Elytra*, alitrunk,* and abdomen very much dilated, nearly twice the width of the prothorax, without furrows, with several rows of obsolete mammillated impressions. *Legs* rather longer and more slender than those of *Elaphrus*; the *hands* of the male have the first four joints a little dilated and furnished underneath with a brush.

[61] 87. *OPISTHIUS RICHARDSONII*, Kirby.—Plate i. fig. 9. Length of body $4\frac{1}{4}$ lines; breadth of prothorax 1 line; of elytra taken together $2\frac{3}{4}$ lines. Mr. Drummond, from my description of this curious insect, thinks it was taken in May, 1825, on an island of Lake Winnipeg, frequenting moist muddy places from which the water had shrunk.

Body with the gloss obscured; underneath black, somewhat hairy, above a little bronzed. Antennæ nearly half the length of the body, first four joints greenish-bronzed, the rest deep blue; front with a slight impression between the antennæ and a few scattered short whitish hairs: prothorax very short, more bronzed, transversely very minutely wrinkled: elytra with three rows of oblong greenish very slight impressions, each with a central oblong elevation, with another levigated one between each; adjoining the lateral margin is a fourth series of greenish-bronzed more numerous impressions without any central or intermediate elevations: thighs green-bronzed, tibiæ obscurely rufous, tarsi black, legs hairy. [Taken at Fort Simpson, Mackenzie River, by Mr. Robert Kennicott.]

88. *ELAPHRUS CLAIRVILLII*, Kirby.—Plate i. fig. 8. Length of body 4 lines. A single specimen taken in the journey from New York to Cumberland-house.

[62] Body glossy; underneath green-bronzed; above black slightly bronzed, covered with minute scattered, gilded punctures. Mandibles and palpi piceous; antennæ black, with the three first joints dark blue; front with an elevation between the eyes, rather deeply impressed in the centre: prothorax longer than wide, uneven, with two large discoidal elevations separated by a dorsal channel, each with a central impression; a single basilar impression at the posterior angles tinted with blue: elytra with four irregular rows containing in all twenty-one slight circular impressions punctured, and tinted with blue, each, except the marginal ones surrounded by an elevated ring, and placed in a wider impression; between each of these impressions in the two first rows is an elevated and levigated space: thighs glossy-green, the posterior pair rufous at the base; tibiæ and tarsi piceous.

I am doubtful whether this species may not be Mr. Say's *E. riparius*, but it is not the real one, from which, and *E. uliginosus*, it is distinguished by

* The alitrunk is that part which bears the wings and the four posterior legs.

being much less thickly dusted with green-gold glittering punctures, which gives it a blacker hue. The impression also in the elevated space between the eyes is much deeper. The blue-tinctured impressions of the elytra are also more distinct, and surrounded by a more elevated ring. [Taken on the Island of Toronto by Mr. Couper, *Can. Journal*, 1856, p. 33.]

89. *ELAPHRUS INTERMEDIUS*, Kirby.—Length of body 4 lines. Taken by Dr. Bigsby in Canada.

This species resembles *E. cupreus*, but it is quite distinct. The body is more thickly and minutely punctured on the whole upper surface; underneath it is of a fine bronzed-green; above it is blacker and less brilliant; the head is greenish; the middle space between the eyes is less elevated than in that species, and wrinkled longitudinally without any impression: the impressions on the discoidal elevations of the prothorax are fainter: the elytra like the other species have a quadruple series of impressions, but they are broader, more slight, without any elevated ring, are more minutely punctured, have a slight elevation in the centre, and are of the same colour with the rest of the elytrum; the marginal series is nearly obsolete; just before the middle, adjoining the suture is a quadrangular elevation which unites with that of the other elytrum: the thighs are green, rufous at the base, tibiae rufous, tarsi piceous. [Taken in Canada.]

[63] 90. *ELAPHRUS OBSCURIOR*, Kirby.—Length of body $3\frac{1}{2}$ lines. A single specimen taken in Lat. 65° .

This species is more strongly marked than the majority of the *Elaphri*. On the underside the head and trunk are copper with a slight tint of green; the abdomen of a dusky purplish copper: above it is copper-coloured; the head, with the exception of the upper-lip, is very thickly and confluent punctured, with a levigated but scarcely elevated space between the eyes; the four first joints of the antennæ are cupreous: prothorax not wider than the head, confluent and thickly punctured; discoidal elevations not conspicuous nor impressed; elytra not glossy, punctured with scattered punctures, marked by a quadruple series of very slight impressions, some nearly obsolete, most of them marked out by a very slight elevated ring and a circle of punctures, three levigated quadrangular spaces near the suture, and arranged in a line parallel with it, and a fourth triangular one removed from it, near the apex; the disk of the elytra is faintly purple: legs bronzed.

91. *NOTIOPHILUS AQUATICUS*, Linn.—One specimen taken. [An erroneous determination, according to Dr. LeConte, who considers it to be *N. semistriatus*, Say. For description, which very closely corresponds with Kirby's, *vide* Say's Ent. Works, ii. 497.]

[65] 92. OMOPHRON SAYI, Kirby.—Taken by Dr. Bigsby in Canada. Length of body $3\frac{1}{2}$ lines.

This species seems intermediate between *O. limbatum* and *O. labiatum*. From the former it differs in having a much fainter tint of green on the darker parts of the body; in its black prothorax with silvery sides as well as margin. From the latter in having the lateral furrows as deep and distinctly punctured as those of the disk; and, instead of two reddish spots near the base of the elytra, having two angulato-undulated bands, one near the base and the other beyond the middle, and the tips testaceous; all connected by the margin of the same colour. It seems to have escaped the describers of *O. limbatum* that the upper-lip and lateral margin of the prothorax and elytra are likewise silvery, though not so conspicuously as in *O. labiatum* and *Saii*.

The sculpture of the elytra in this genus, as well as in *Calosoma*, differs from that of the other terrestrial predaceous beetles in having more than nine furrows, which appears to be the typical number in the section. [Synonymous with *O. Americanum*, Dej.; taken in many parts of Canada.]

[End of the CARABIDÆ.]

LEPIDOPTEROUS LARVÆ FIGHTING;

AND TENACITY OF LIFE IN LARVA OF CLISIOCAMPA SILVATICA.

BY HENRY L. MOODY, MALDEN, MASS.

On returning from a collecting tour, one day in last June, I emptied my larvæ box, putting in a collar box for a short time a larva of *C. Silvatica*, one of the Geometrid and one other Lepidopterous larva: the two last I could not identify, but they were all Lepidopterous. I did not open the box until three or four hours afterwards, when I found a decided change in the appearance of my larvæ. The *C. Silvatica* larva was bitten entirely apart, the head and three first segments being in one piece, the three last abdominal segments in another; the remaining segments were in an indistinguishable mass on the bottom of the box. The geometrid larva was in almost as bad condition, but was not bitten apart; the third was uninjured.

I have always supposed Lepidopterous larvæ incapable of seriously injuring each other, and have never heard or read of their doing so. I have often seen them bite at each other quite spitefully, but their bite seemed to be harmless. But here is surely an instance of decided and continued pugnacity; for to have inflicted the amount of injury that each received must have

required some time, and the appearance of the larvæ certainly indicated that they did not give up the struggle until obliged to from weakness.

An equally surprising circumstance to me was the tenacity of life in the *C. Silvatica* larva. When I opened the box, the fluids from their bodies were thoroughly dried on the bottom of it, showing that they must have had their quarrel at least an hour before; yet the piece of the C. S. larva, consisting of the head and three first segments, was quite active. I placed it on my table and watched its movements. It moved at the rate of two inches in three minutes, moving in a direct line. When we consider that it had left only six legs out of sixteen, we must say that it was doing very well. I then placed it on its back, and it moved its legs freely, and made an effort to turn over on its feet. I also noticed that it moved its jaws freely.

What I have related, both in regard to the larvæ fighting, and the tenacity of life, was to me very surprising, but your readers may know of other similar instances. I should like to hear from them on the subject.

THE INCORPORATED ENTOMOLOGICAL SOCIETY OF ONTARIO.

A general meeting of the Entomological Society of Canada was held in the Rooms of the Canadian Institute, Toronto, on Thursday morning, March 2nd, 1871. E. Baynes Reed, Esq. (London), Vice-President, occupied the chair. A goodly number of members were present, including several from the London Branch of the Society.

The minutes of the last meeting, and the Report of the Committee on the Cabinet for the Agricultural and Arts Association, were read and adopted.

Letters were also read from Prof. Hincks, Messrs. Couper, Cowdry and Websdale.

The application of certain gentlemen at Kingston, Ont., who desire to form a Branch of the Society there, was read, and on motion laid over to the afternoon meeting for consideration.

Mr. Reed read the correspondence with the Bureau of Agriculture of Ontario, and gave a statement of the proceedings that had taken place with reference to the incorporation of the Society. He also read the "Act to amend the Agricultural and Arts Act," which had been passed at the recent session of the Legislature, and which included provisions for the incorporation of the Society.

It was then moved by Mr. Wm. Saunders, seconded by the Rev. C. J. S. Bethune,

That the Entomological Society of Canada gladly avails itself of the benefits arising from the liberality of the Government of Ontario, as set forth in

the amended Agricultural Act; and that the meeting do now proceed to comply with the requirements of the Act of Incorporation.—*Carried.*

Mr. Saunders then gave notice that at the next meeting of the Society he would move that the Constitution be amended so as to bring it into accordance with the Act of Incorporation.—The meeting then adjourned.

AFTERNOON MEETING.

A second meeting of the Society was held, pursuant to notice, at 3 o'clock, P.M., on the same day as the preceding, and at the same place.

The President, Prof. Croft, occupied the chair. The minutes of the previous meeting were read and adopted.

In accordance with the notice of motion given by Mr. Saunders at the former meeting, the Constitution of the Society was taken up for discussion, and amended in accordance with the provisions of the Act of Incorporation. [We shall publish the Act and the Constitution as amended in our next number.—ED. C. E.]

The following gentlemen were elected to hold office for the ensuing year:

PRESIDENT—Rev. C. J. S. Bethune, Trinity College School, Port Hope.

VICE-PRESIDENT—W. Saunders, Esq., London.

SECRETARY-TREASURER—E. Baynes Reed, Esq., London.

DIRECTORS—Prof. Croft, University College, Toronto; J. M. Denton, Esq., London; and R. V. Rogers, Esq., jun., Kingston.

AUDITORS—J. H. Griffith, Esq., and C. Chapman, Esq., London.

The following gentlemen were elected members of the Society:—A. B. Bennett, Esq., Brantford, Ont., and D. W. Beadle, Esq., St. Catharines, Ont.

The application from Kingston, for the formation of a Branch of the Society there, laid over from the previous meeting, was received, and permission was granted to establish a Branch, in accordance with the terms of the Constitution of the Society.

After some discussion, it was resolved that Art. I. sec. ii. of the Constitution be held in abeyance till the next annual meeting of the Society, and that in the meantime any person be admissible as an ordinary or associate member on payment of one dollar. The annual subscription of members, entitling them to a copy of the *Canadian Entomologist* and all other publications of the Society free of charge, had been previously reduced in the amended Constitution to one dollar per annum. Any one, therefore, sending this amount to the Secretary-Treasurer can become a member of the Society at once.

It was resolved to transfer the printing and publication of the *Canadian Entomologist* to London, to increase its size, and issue it in a much more attractive form, embellishing its pages with suitable illustrations. The Rev.

C. J. S. Bethune was unanimously requested to continue to act as Editor, and Messrs. Saunders, Reed and Denton were appointed a Committee to assist him in the work. The sum of one hundred dollars per annum was also voted to be paid to the Editor from the Society's funds.

The following was also adopted: "That the hearty thanks of this Society are tendered to the Rev. C. J. S. Bethune, for his untiring zeal and activity while holding the office of Secretary-Treasurer during the last eight years."

The meeting then adjourned.

MISCELLANEOUS NOTES.

COLIAS PHILODICE.—I suspect that at least two species are passing under the name of *Colias Philodice*. I bred from the egg several larvæ last season that differed in important respects from those I had before bred in like manner, and which last agreed with Mr. Saunders' description in vol. i. *Can. Ent.* p. 54. In the first named, on each segment, beneath the white lateral stripe, was a black spot, semicircular, and conspicuous. Mr. Saunders makes no mention of these spots, nor had I before observed them on other larvæ. The imagoes from these larvæ are of one of the peculiar varieties, or what has been considered as such, of *C. Philodice*. The species is known to vary widely, but some of the supposed varieties are extreme—almost too much so to be considered varieties, unless proved to be so by actual breeding from the egg.—W. H. EDWARDS, West Va. Jan. 27, 1871.

EXCHANGES, &c.

LEPIDOPTERA.—Canadian Lepidoptera desired in exchange for British.—E. H. COLLINS, *Daily News* Office, Kingston, Ont.

PUPÆ AND OVA OF LEPIDOPTERA.—I am desirous to obtain, if possible, *live* Pupæ and Ova of certain Canadian and other North American Lepidoptera. Would purchase, or give in exchange English or other European species.—CHAS. GEO. ROTHERAM-WEBSDALE, 78 High-street, Barnstaple, England.

COLLECTING TOUR IN WESTERN TEXAS AND NEW MEXICO.—At the request of several gentlemen in this country and Europe, I intend to make an extensive eight or nine months Entomological collecting tour in Western Texas and Southern New Mexico, if sufficient means can be raised. I therefore invite every Entomologist, who wishes to enrich his collection with valuable and unknown species, to assist me in the undertaking. To give everybody a fair chance to get a part of my collections at a limited price, I will divide them into shares at the following rates:

Whole share, \$25. Distribution to be from 250 to 500 specimens, in accordance with wishes (Diurnal Lepidoptera and specialties at agreement.)

Half shares, \$12 50. Half the above.

Young collectors or beginners at \$5 per 100 specimens.

All sums to be paid in advance.

I shall be obliged by receiving early information from all desiring to subscribe, stating at the same time their wishes. When and where the money is to be delivered, will be notified in due time. No insects will be sold separately after my return, except to subscribers. If anything should happen during the tour to prevent my fulfilling my engagements, or if any one dislikes his share, the money will be refunded. The Coleoptera and Diurnal Lepidoptera will be sent named. Address:—G. W. BELFRAGE, Waco, McLennan Co., Texas (Care of Forsgard & Co.)

(We can cordially recommend Mr. Belfrage to our readers as an active and zealous collector: his mounting of specimens is the very perfection of neatness.—ED. C. E.]

COLEOPTERA.—I am desirous of exchanging Coleoptera, especially *Cicindelidæ*, with collectors at a distance.—GEO. DIMMOCK, Springfield, Mass.

COLEOPTERA AND LEPIDOPTERA.—I have a few *Cychnus Andrewsii* and *Ridingsii*, which I should like to exchange for rare Canadian insects: Lepidoptera preferred.—THEODORE L. MEAD, 596 Madison Avenue, New York.

COLEOPTERA.—I should be pleased to exchange Coleoptera with some Canadian Coleopterists, or would purchase species not found in my locality.—ANDREW S. FULLER, Woodside Garden, Ridgewood, Bergen Co., N. J.

ADVERTISEMENTS.

TEXAN INSECTS.—25,000 specimens of Insects from Texas, for sale or exchange. (Reference to Ed. CAN. ENT.)—G. W. BELFRAGE, Waco, McLennan Co., Texas; Care of Forsgard & Co.

CORK AND PINS.—We have received a fresh supply from England, of sheet cork of the ordinary thickness, price 16 cents (gold) per square foot; and a full supply of Klæger's pins, Nos. 1 to 6, price 50 cents (gold) per packet of 500. Orders will please state whether the package is to be sent by mail or express.

AGENTS FOR THE CANADIAN ENTOMOLOGIST.

CANADA.—E. B. Reed, London, Ont.; W. Couper, Naturalist, Montreal, P.Q.;

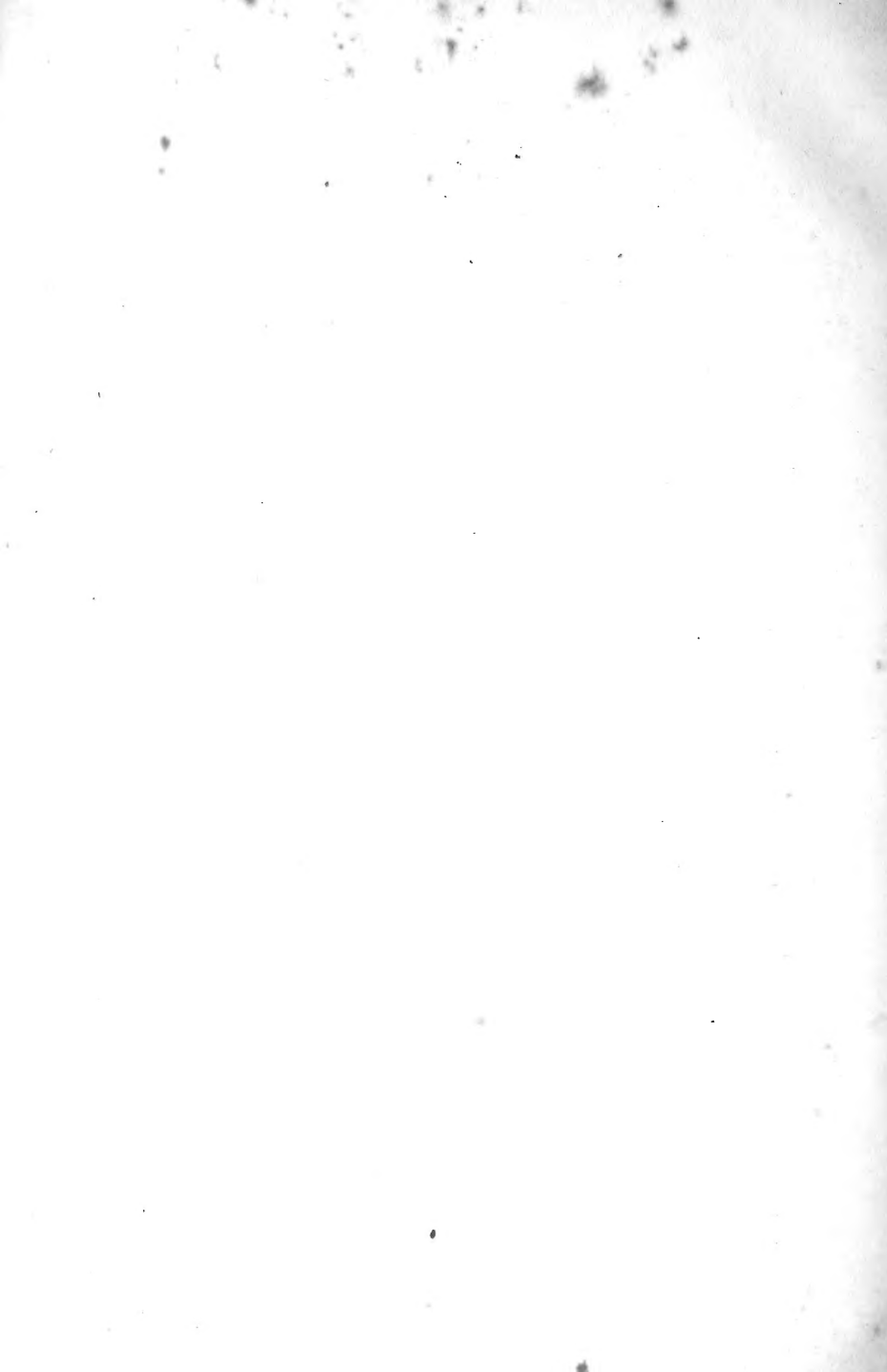
G. J. Bowles, Quebec, P.Q.; J. Johnston, Canadian Institute, Toronto, Ont.

UNITED STATES.—The American Naturalist's Book Agency, Salem, Mass.; J. Y.

Green, Newport, Vt.; W. V. Andrews, Room 17, No. 137 Broadway, N.Y.

ENGLAND.—Wm. Wesley, 81 Fleet-street, London, E.C.—Subscription, 5s. per vol.





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